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SOME FACTORS IN THE UNDERGRADUATE CAREERS OF YOUNG COLLEGE STUDENTS

WITH PARTICULAR REFERENCE TO
COLUMBIA AND BARNARD COLLEGES

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H. A. G.

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SOME FACTORS IN THE UNDERGRADUATE CAREERS OF YOUNG COLLEGE STUDENTS

CHAPTER I

INTRODUCTION

The Problem Stated

The object of this investigation is sixfold:

First, to survey the literature in the field of higher education during the past decade in order to discover regulations, opinions, and evidence concerning the feasibility of students being admitted to higher institutions of learning while younger than the average entrance age.

Second, to secure the reactions of college authorities who are forced to deal with the problem, and of former college students who have had the experience of facing the situations created by their youth, to the multitude of questions involved in the investigation.

Third, to make a detailed analysis of the individual college records of one hundred twenty-six boys and twenty-eight girls who entered Columbia and Barnard Colleges under sixteen years of age during the five-year period from 1921 to 1925, inclusive.

Fourth, to isolate what seem to be the most influential factors in their undergraduate achievements and experiences, and to determine the relationship of those factors to their college life.

Fifth, to attempt to set up admission criteria from the measures employed, which will better enable college officers to decide the question of admission of the individual applicant whose chronological age is obviously less than that of his prospective classmates.

Sixth, to test the necessity for, and the desirability of, minimum age requirements for college entrance.

Sources of the Data

The data utilized in this investigation were taken from the following five sources: (1) Official college records in various

offices and departments of Columbia and Barnard Colleges, New York City. (2) Books and periodicals containing information relevant to the problem. (3) Student publications of Columbia and Barnard Colleges. (4) A questionnaire which was sent to one hundred twenty former Columbia and Barnard College students. (5) Interviews with college and university officials in and about New York City, as well as with former students in the metropolitan area.

Collection of the Data

Where possible, all available records were duplicated on forms provided for that purpose and checked so as to insure the utmost accuracy. Information taken from books and periodicals was transferred to index cards, together with the complete reference to the book or periodical. The data gathered from student publications were verified by checking them with other records and having them corroborated by the former students and college authorities. The replies to the questionnaires were tabulated in the usual fashion, after they had been checked with other sources and an attempt had been made to establish the reliability of the answers. A checking list was devised, from which the results of the interviews with the former students and college officials were tabulated, together with other information.

Treatment of the Data

An attempt has been made to present in discursive form both positive and negative consensus of fact and opinion in an effort to treat the whole problem in an unbiased manner and to discover the facts of the case.

Where possible, the data were arranged in objective form, and such statistical treatment as was considered pertinent to the problem was applied. To insure maximum reliability of the measures employed in the interpretation of the data, all correlations, measures of variability, and other relationships were machine calculated, for the most part, at the statistical bureau of Columbia University.

Limitations of the Data

It is recognized that the data obtained from the Columbia and Barnard student bodies are far from being representative of

the typical American liberal arts college body, and that conclusions drawn from this source alone will not be applicable to the undergraduate population of the nation as a whole. The causes of this condition lie in the fact that the two groups in question come from a highly urbanized area and are, in the main, offspring of foreign-born parents. In addition to this the students go through a more highly selective process, due to local problems involving numbers and the necessity of choosing only those students who are most likely to profit from collegiate training, than do the students in the average American undergraduate college.[1] Again, the students selected because of their age are as a group approximately three years younger at the age of college entry than is the average college or university freshman in the United States.[2]

However, it is hoped that there will be brought to light many facts, which will be of value to other investigators and possibly stimulate research on the problem in other institutions, culminating in the adoption of policies and techniques which will facilitate the intelligent treatment of college and university admission questions with respect to age.

[1] United States Bureau of Education, Bulletin, 1924, No. 35, Chap. 8.
[2] *Ibid.*, p. 103.

CHAPTER II

ATTITUDES TOWARD MINIMUM AGE REQUIREMENTS FOR COLLEGE ENTRY

The following pages pertain to the results of bibliographical research covering the period of the last ten years and contain the opinion of educators; institutional and statutory regulations; and statistical findings concerning the youth entering college under certain age limits.

General Opinions

Haggerty [1] considers the matter of age at entrance to college to be a moot question. "Mental and physical growth, social adjustments, and individual differences in emotional endowment, together with a host of environmental factors, leave us in ignorance on the question."

Jones [2] concludes from his investigation that students entering college at a younger than average age do better scholastic work than do older students; that while not participating as much in varsity athletics, they are prominent in debate, dramatics, and school journalism; and that the younger students achieve more success in life than do the older ones.

Rice [3] urges that not only should the young gifted student be admitted to college but that special provisions for the development of his native ability should be made after he reaches its doors.

Jones [4] reports that Northwestern University has abolished the minimum age ruling, since the studies made at that institution show the younger student to be superior in his academic achievement and equally prominent in other activities.

Baldwin and Holmes,[5] however, feel that the young students miss many academic values and associations that they should

[1] Haggerty, quoted from Hudelson, E. (editor), *Problems of College Education*, p. 215.
[2] Jones, A. J., *The School Review*, 33: 184–90, March 1925.
[3] Rice, J. A., *School and Society*, 22: 543–47, October 31, 1925.
[4] Jones, E. M. L., *Student Personnel Work at Northwestern University*, p. 56.
[5] Baldwin and Holmes, quoted from Jones, A. J., *op. cit.*, p. 164.

have with those their own age, when they are placed in a group of pupils who are older physiologically and socially.

Contrariwise, Jordan [6] favors early choice of specialization by the young student and his proper orientation and guidance by college faculty members.

As Regards Scholarship

Terman,[7] in commenting on the issue, states that "the minimum age limit has the opposite effect from what is desired. It is not in accord with the function of an institution of higher learning. The use of psychological tests in the schools is breaking the lock step and allowing the gifted child to reach college earlier. The sixteen-year age limit brings about the rejection of those candidates who found it easy to master the twelve lower grades and should be abandoned."

Terman is supported in his statement by A. L. Jones,[8] who found a clear correlation between the lower age of admission and higher scholarship. He states, "Those who enter below the average age have usually done so in spite of the obstacles which have held some of their fellows beyond the average."

Gow [9] is of the belief that we must train only the fit, but surely more of them. "Universities should not passively seek applicants for admission, but must go out and find able young men and women and urge them to go on." He advocates that exceptional inducements be offered young students in an effort to increase their number in college.

Lowell,[10] in an address made to the joint meeting of the Association of American Universities and the American Association of Medical Colleges in New York City in 1929, urged that instead of cutting the college course to three years and thus shortening the time required for preparation, the better plan would be to get students in college at an even younger age than now. "That the younger the boys are the better scholars they are and the better behaved they are."

Jones [11] concludes that such proponents of the reorganization

[6] Jordan, D. S., *Trend of the American University*, p. 78.
[7] Terman, L. M., *The School Review*, 32: 406–07, June 1924.
[8] Jones, A. L., *School and Society*, 3: 717–20, May 13, 1916.
[9] Gow, quoted from Amos, T. W. and others, *And So to College*, p. 11.
[10] Lowell, A. L.; later corroborated in a letter to the writer.
[11] Jones, A. J , *op. cit.*, p. 164.

of secondary and higher education as Elliot, Harper, and Dewey, for allowing a young man to begin his career of service to society earlier in life, point to the desirability of having the student enter college as early as possible.

However, Odell,[12] in studying the first-year college marks of 1,677 freshmen from over one hundred institutions, found no reliable positive, and mostly negative correlations, between entrance age and success as determined by marks. He concludes: ". . . there is a very slight tendency for freshmen who are below the average age of their group to do better work than is done by those above the average age."

Lowell, who has been previously quoted, is partially upheld in his statement by Payne,[13] who found the average age at entrance to the College of the City of New York tending to decrease, with the younger students distinctly excelling the older ones in academic achievement.

Concerning Intelligence

Jones,[14] after studying the birth dates of the probation, average, and superior students at Northwestern University by classes and as a group, discovered the students making average progress to be younger than the ones on probation, and the students considered superior slightly younger than the average group.

Pittinger,[15] in his study of 329 men and 499 women who entered the University of Minnesota in 1910–11, found that students who enrolled at ages younger than normal entrance age stood higher and remained longer, on the whole, than those who entered normally or older. He attributes their records to their being intellectually superior individuals from the beginning.

The intelligence test achievement of students at the same institution is reported by Van Wagenen[16] to the effect that only 17.8 per cent of the women students who entered the College of Science, Literature, and Arts between 19 years and 19 years 6 months, and 43 per cent of the men entering at those ages, reached or exceeded the median mental test score of freshmen

[12] Odell, C. W., *Predicting the Scholastic Success of College Freshmen*, p. 29.
[13] Payne, A. F.; from data supplied to the writer.
[14] Jones, E. McL., *op. cit.*, p. 132.
[15] Pittinger, B. F., *Sixteenth Yearbook of the National Society for the Study of Education*, Part II, p. 303.
[16] Van Wagenen, M. J., *School and Society*, 9: 663–66, May 31, 1919.

entering at the age of 17 years to 17 years 6 months, with an even smaller percentage of the twenty-year-olds reaching the median score of the younger freshmen.

Similarly, Bear [17] found the sixteen- and seventeen-year-old freshmen at Centre College in 1925 leading all the other students in intelligence test scores and scholastic achievement, ranking in the order of those ages.

A more extreme comparison between ages and intelligence is to be found in Jones's [18] study of the differences between a group of extension students and 159 freshmen at Yale University, where the difference was more than one standard deviation of the college distribution on the Army Alpha Test in favor of the freshmen.

Nelson and Denney [19] found the median score on the Terman test made by sixteen-year-olds at Iowa State Teachers College to exceed the scores made by all other age groups except those over twenty-five years of age.

Whinery,[20] after testing 234 freshmen entering Ohio State University during the school years 1923–25, inclusive, discovered a difference in age of one year and four months between groups making low and high scores on the intelligence tests. Those rating highest being the youngest, and with less variation than those rating low, Zeigel [21] found high school honor students at the University of Missouri in 1926 to be superior mentally; to have more extra-curricular activities; to be younger; and to graduate in less time than the older students.

The Problem in the Past

A historical note is of interest at this point.[22] Students entered college younger during the first third of the last century, than during the later decades. Even in 1851, one writer spoke of boys' entering college at 15 or 16 years of age. The median age for students entering Harvard College increased from 16 years 3 months in 1830 to 18 years 7 months in 1880.

Table I shows the conditions in regard to age of entrance in

[17] Bear, R. M., *School and Society*, 24: 802–04, December 25, 1926.
[18] Jones, H. E., *School and Society*, 26: 470, October 8, 1927.
[19] Nelson, M. J., and Denney, E. C., *School and Society*, 26: 501, October 15, 1927.
[20] Whinery, S. M., *School and Society*, 24: 372, September 18, 1926.
[21] Zeigel, H., Jr., *School and Society*, 25: 82–84, January 15, 1927.
[22] Taken from Hudelson, E. (editor), *Problems of College Education*, p. 129.

TABLE I

DISTRIBUTION OF STUDENTS BY AGES IN VARIOUS INSTITUTIONS, 1800–1921

INSTITUTION	PERCENTAGE ENTERING 15.5 YEARS OR YOUNGER	PERCENTAGE ENTERING 16.5 YEARS OR YOUNGER
Amherst 1827–31	18.4	31.4
Bowdoin 1807–10	30.5	45.7
Dartmouth 1800–04	16.3	26.8
Harvard 1829–32	36.1	66.8
Harvard 1916	0.7	6.8
Minnesota 1921	0.3	4.4

several institutions at various periods. "Thus all of the distributions show large proportions of students entering at from 11 or 12 to 16.5 years of age." The reason for the change to the present condition is attributed to the increased entrance requirements, curriculum changes, and other factors.

SUCCESS IN AFTER LIFE

A number of studies are available in regard to the relation of age at graduation from college to "success" in life as determined by the listing in *Who's Who*. Cleland,[23] after studying the graduation ages of 4,000 men so listed, discovered a larger percentage among those who graduated at 19, 21, and 20 years of age, ranking in the order given, than at any other age. Similarly, Jones [24] found the average age at graduation from college of 1,080 people selected at random from *Who's Who* to be 21 years 7 months as compared to 23 years 1.9 months for all graduates.

Another interesting side light may be in order at this time, though it is recognized that the following cases of genius are quite exceptional. Emerson and Lowell entered Harvard College at the ages of 14 and 15 years, respectively. Bryant became a freshman at Williams at 15 years of age, and Longfellow entered Bowdoin before his sixteenth birthday.[25]

Whipple [26] gives an account of a German youth who at the age of nine years read German, French, Italian, Latin, and Greek

[23] Cleland, J. S., *School and Society*, 21: 31–32, February 20, 1926.
[24] Jones, A. S., *op. cit.*, p. 189.
[25] Hudelson, E. (editor) *op. cit.*, p. 131.
[26] Whipple, G. M., in the *Twenty-Third Yearbook of the National Society for the Study of Education*. Part I, p. 3.

and matriculated shortly thereafter at the University of Leipsig to be awarded the Ph.D. "with distinction" before he had reached his fourteenth birthday. He was made a Doctor of Laws two years later and was then appointed to the teaching staff at the University of Berlin.

Among many prominent Americans are to be found persons who entered college younger than their fellows. Charles Evans Hughes entered Colgate University at the age of 14, later transferring to Brown University from which he graduated at the age of 19 to embark upon a remarkable career in public life.[27]

Hollingworth [28] reports a young prodigy, to be included in this study, who was admitted to Columbia College at the age of 12 years 3 months and was graduated within eleven days of his fifteenth birthday. He continued his studies and was awarded the M.A. degree before he reached his sixteenth birthday. Two years later he completed the work required for the Ph.D. degree and then entered a theological seminary where he was ordained when he reached his majority.

Space does not permit the further enumeration of the case studies available, and in summarizing the findings in the literature so far, three important conclusions seem warranted.

1. The majority of educators who have expressed their views in the literature on the subject seem to favor the early admission of otherwise well-qualified students to institutions of higher learning, even though they are younger than those with whom they will have to associate.

2. The statistical evidence shows that, taken as a whole, there is an inverse correlation between age and intelligence test achievement; that is, the younger students seem to be more capable of performing the intellectual tasks which await them in their scholastic activities.

3. Taken as a group, the younger students do achieve more scholastic success than average or over-age students and also have greater chances for success in later life.

Professional Opinion in New York City

Table II gives the opinions of twenty-five college officers of administration and instruction relative to questions which con-

[27] *Public Men and Women of America.*

[28] Hollingworth, L. S., *Journal of Applied Psychology*, II: 385–90, October 1927.

TABLE II

OPINIONS OF TWENTY-FIVE COLLEGE AUTHORITIES CONCERNING COLLEGE STUDENTS YOUNGER THAN SIXTEEN YEARS OF AGE

QUESTIONS	YES	NO	UNCERTAIN
1. Fewer follow vocations trained for	1	10	14
2. Unable to assume responsibility soon after graduation from college	3	14	8
3. Change vocational plans more often than older students	7	13	5
4. Need more guidance and attention while in college than older students	2	19	4
5. More provision should be made for young, superior, students in college	24	0	1
6. Younger students need more "how to study" instruction than others	2	21	2
7. Faculty members make better advisers than "big brothers and sisters"	23	1	1
8. Younger students have more registration difficulties	3	18	4
9. All students should be grouped according to mental ability for instructional purposes	14	5	6
10. Such a grouping is undemocratic	3	21	1
11. Younger students are better off in small colleges and classes	5	18	2
12. Younger students are more susceptible to mental or physical breakdowns	2	19	4
13. More subject to immoral influences	1	21	3
14. Present more disciplinary problems	1	22	2
15. Should be admitted under sixteen years of age	22	0	3
16. Find it more difficult to adjust themselves to college life than older students	12	7	6
17. Give more trouble in dormitories	1	21	3
18. Participate less in extra-curricular activities than older students	12	10	3
19. Are popular with older students	16	4	5
20. Are less capable of participating in the social life of the campus	12	10	3
21. Are more intelligent as a group than the older students	21	2	2
22. Do better scholastic work as a group	18	4	3
23. All in all, can profit from admission to college, under the prevailing conditions, as much as older college groups	20	2	3

cern a younger-than-average student on the college campus. They may be taken at their worth as representing the verbal opinion obtained by interviewing twenty-five adults in six different public and private institutions, who based their judgments on experiences and observations of the problem as it exists in the metropolitan area. The list of questions is by no means complete and was arranged by the writer, after several preliminary interviews, in an effort to consider only what seemed to be the more potent factors involved.

In summarizing the contents of the table, it is evident that the majority of the educators represented feel that the most undesirable features of early entry to college lie in the social adjustments which the young student has to make, albeit the opinion is almost evenly divided on this point. In matters of vocational adjustment the younger student appears to be at no disadvantage with the older ones. The opinion is in favor of smaller classes for instruction purposes, ability grouping, and faculty advisory systems. In is also the belief that the younger students are no more subject to physical or nervous disorders, disciplinary measures, or undesirable influences than their senior classmates. They are recognized as being superior intellectually and in academic achievement and, in the main, able to profit from their college experiences as much as the older groups.

To quote the dean of one prominent institution, "We consider it policy-wise to disregard the entrance age requirement in the case of the applicant who meets our requirements in other respects. Our experience has been to the effect that more harm than good is done in refusing admission to these young people who are constantly increasing in numbers and should be given every consideration even though their social immaturity may be of some handicap to them."

Institutional Regulations

Table III shows the entrance age provisions included in the catalogues of 300 colleges and universities selected at random from those in the United States. As unsatisfactory as this source of information is, it does indicate, to some extent, the attitude of the institutions concerned toward the question. In proportion to their numbers, the state institutions seem to be more severe in the age requirement than the private and parochial ones, assum-

TABLE III

MINIMUM AGE REQUIREMENTS FOUND IN 300 LIBERAL ARTS COLLEGE AND UNIVERSITY CATALOGUES SELECTED AT RANDOM *

	State Institutions			Private Institutions			
	Age 15	Age 16	None	Age 14	Age 15	Age 16	None
Alabama	..	..	2	..	..	..	5
Arizona	..	1	..	..	..	..	..
Arkansas	..	1	1	..	..	..	6
California	..	..	1	..	..	..	7
Colorado	..	..	2	..	..	..	1
Connecticut	..	..	1	..	..	..	2
Delaware	..	..	..	..	..	....	1
District of Columbia	..	..	1	..	..	..	4
Florida	..	1	2	..	..	..	2
Georgia	..	1	1	..	..	1	5
Idaho	..	1	1	..	..	..	6
Illinois	..	1	2	..	..	..	11
Indiana	..	..	2	..	..	..	8
Iowa	..	2	1	..	..	..	10
Kansas	..	..	2	..	..	..	6
Kentucky	..	..	2	..	1	..	3
Louisiana	..	2	1	..	..	..	2
Maine	..	..	1	..	..	..	1
Maryland	..	..	1	..	..	..	2
Massachusetts	..	..	..	..	1	..	9
Michigan	..	1	..	..	..	..	7
Minnesota	..	1	..	..	..	..	3
Mississippi	..	1	..	1	..	..	5
Missouri	..	..	1	..	..	..	4
Montana	..	1	..	..	..	..	1
Nebraska	..	..	1	..	..	..	4
Nevada	..	..	..	..	..	..	1
North Carolina	..	..	1	1	..	1	9
North Dakota	..	..	1	..	..	..	3
New Hampshire	..	..	1	..	..	..	1
New Jersey	..	..	1	..	..	..	4
New Mexico	..	..	1	..	..	..	..
New York	..	..	..	..	5	1	14
Ohio	..	1	2	..	..	..	15
Oklahoma	1	..	..	..	..	..	1
Oregon	..	..	1	..	..	..	2
Pennsylvania	..	..	1	..	..	2	20
Rhode Island	..	..	..	..	..	..	2
South Carolina	..	2	..	..	..	..	9
South Dakota	..	..	1	..	..	..	2
Tennessee	..	..	1	..	..	1	6
Texas	..	..	1	..	..	1	4
Utah	..	..	1	..	..	..	1
Vermont	..	1	..	..	..	..	2
Virginia	..	1	..	..	2	..	2
Washington	..	..	1	..	..	..	1
West Virginia	..	1	..	..	..	1	2
Wisconsin	..	..	1	..	..	..	2
Wyoming	..	..	1	..	..	..	..
Total	1	20	42	2	9	8	218

* Selected by choosing approximately every second college or university from a list arranged alphabetically.

ing, of course, that those institutions not mentioning a minimum age of entrance in their catalogues do not attempt to regulate it.

Sixteen years seems to be the modal practice with state schools, while only about 8 per cent of the private and parochial schools mention any age requirement at all. Two of the latter types set the minimum at 14 years; nine at 15 years; and eight at 16 years, the last figure being considered by only 40 per cent as many private and parochial as state institutions.

These findings are similar to those of McKown,[29] who discovered the minimum entrance age requirements of 314 colleges to "range from 14 to 17, with 16 the most frequently mentioned."

The earlier college accrediting agencies considered the question, ". . . the Southern Association of Colleges and Secondary Schools, at its first meeting in 1895, adopted the following article as part of its by-laws: 'No college that admits students under 15 years of age shall be eligible to membership in this association.' This article remained part of the by-laws until 1908, when it was dropped." [30]

At the present time no minimum age requirements are listed in the regulations of the different college accrediting associations, as summarized in a recent bulletin of the United States Bureau of Education, 1929, No. 7, from which it is apparent that these agencies no longer consider the matter of age at entry a factor which conditions the standard of instruction offered.

Legal Provisions

An examination of the available statutes of the forty-eight states reveals laws in Kansas[31] and Nebraska[32] which prohibit the exclusion of any person from a state-supported institution of higher learning because of age. However, Arkansas [33] prohibits any student who has not reached the age of 16 years from entering its normal schools. Louisiana [34] requires its male normal school students to be 16, and the female students 15 years of age before they can be admitted. Maine [35] has the entrance age for normal schools a year higher in each

[29] United States Bureau of Education, Bulletin, 1924, No. 35, p. 102.
[30] *Ibid.*, p. 102.
[31] Kansas, *Revised Code of 1923*, Chap. 76, Sec. 307.
[32] Nebraska, *Compiled Statutes 1922*, Sec. 6729.
[33] Arkansas, *Crawford and Moses 1921 Statutes*, Sec. 9596.
[34] Louisiana, *Marrs, Ann. Revised Statutes 1915*, Sec. 2706.
[35] Maine, *Revised Statutes 1916*, Sec. 143, p. 389.

case. Other states, Colorado[36] and New York,[37] confine the age requirements to agricultural colleges, it being 15 and 14 years, respectively, in the states mentioned or, in the case of the latter state, the completion of an elementary school course.

In the states of California[38] and Illinois[39] a minimum age limit is set for all state institutions of higher learning, the limit being 14 years in the former state and 15 years in the latter.

The following states have miscellaneous restrictions. Delaware[40] requires that no person should be nominated to receive a state scholarship to Delaware College if he is under 16 or over 21. Florida[41] maintains separate colleges for men and women, but women over 21 may take courses at the men's college which are not offered at the women's college. Kentucky[42] prohibits any state scholarship for higher education being given to students who are younger than 14 or over 24 years of age, and Texas[43] requires students applying for admission to the Sam Houston State Teachers College and to the Prairie View State Normal and Industrial College (colored) to have reached the age of 16. The state of Washington[44] requires all students entering the state university to be 16 years of age, although female students may enter the state normal school at the age of 15.

To the best of the writer's knowledge and information obtained from authoritative sources, no other states attempt to regulate the age of admission to their higher institutions, but it is evident from the preceding citations that coercion has been brought to bear on the legislatures of the states mentioned to make laws establishing the age at which the youth can best begin to profit from higher education!

Requisites for Entry to Columbia and Barnard Colleges

The entrance requirements of Columbia and Barnard Colleges, of Columbia University, the institutions to which particular

[36] Colorado, *Compiled Laws 1921*, Sec. 8070.
[37] New York, *McKinney's Statutes*, Sec. 600, Education Law.
[38] California, *Political Code 1923*, Sec. 1392.
[39] Illinois, *Smith and Hurd Revised Statutes 1929*, Chap. 144, Sec. 29.
[40] Delaware, *Revised Code 1915*, Sec. 2334.
[41] Florida, *Compiled Laws 1927*, Sec. 791.
[42] Kentucky, *Carroll's Statutes 1922*, Sec. 4636C–28.
[43] Texas, *Compiled Statutes 1926*, Sec. 2648 and 2639, respectively.
[44] Washington, *Compiled Statutes 1922*, Sec. 4620.

reference is made in this investigation, do not differ widely in their entrance requirements, being integral parts of the same university. Both colleges require the applicant for regular freshman standing to present evidence of having completed at least fifteen units in the secondary subjects, these units to include three in English, three in mathematics, at least three in one foreign language, one in physics or chemistry, one in history (except in Barnard), and four elective units from an approved list of subjects. In addition, the applicant must show evidence of having graduated from a properly accredited four-year high school with marks 10 per cent above the passing mark of the school. He must present a letter from his high school principal or other authority certifying as to his mental and social promise, together with a health report from a licensed physician showing his physical fitness. He must demonstrate his capacity to profit by college work as evidenced by making a satisfactory score in the Thorndike Intelligence Examination or the Scholastic Aptitude Test, and "should be at least 16 (15 years in Barnard) years of age," though the latter requirement is usually waived, if, after the personal interview given each prospective freshman, the candidate gives the impression of being socially and mentally mature enough to carry on his college studies. With these requirements satisfied, the applicant may take the entrance examinations of the type offered by the College Entrance Examination Board, Columbia University, or the Education Department of the State of New York (Regents) in fifteen units of his high school work, or four comprehensive examinations in English, mathematics, a foreign language, and one other subject designated by the applicant. In case, however, the score on the intelligence or scholastic aptitude test seems to warrant it, the applicant may be excused from the fifteen-unit or comprehensive examination, if he was in the upper quartile of his high school graduating class.

These provisions constitute the entrance requirements of the two institutions in question and are obviously higher than the requirement found in the typical liberal arts college in the United States,[45] resulting in a more highly selected student body, and rendering the data collected from that body subject to the limitations previously mentioned.

[45] United States Bureau of Education, Bulletin, 1924, No. 35.

Summary

In summarizing the contents of this chapter it may be stated that the attitudes of educators, as reflected by the writings in the literature of the past decade, seem to favor the youth beginning his college career at as early a time as possible, even though he be somewhat younger than his classmates. Attention is also called to the undesirability of minimum-age entrance requirements.

The studies reported indicate the younger students to be, as a group, more intelligent and capable of achieving greater academic success and recognition than the average, as well as possibly having greater chances, statistically, for success in later life.

State institutions of higher learning seem to be more severe in the minimum entrance age requirements than private and parochial institutions, judging from the catalogue requirements of three hundred colleges and universities selected at random.

University and college authorities in the metropolitan area believe the younger students to be as capable of profiting from their college training and experiences as the older students, the question seeming to hinge on the matter of social adaptation, on which the opinion was about evenly divided. College and university accrediting associations and agencies have considered minimum entrance age requirements in their regulations, but this practice has been discontinued, and at the present time no provisions for the question can be found in the by-laws of such organizations.

Two states have laws prohibiting discrimination on account of age against any person who seeks the opportunity of studying within their higher educational institutions, while three states regulate the age of entrance to their normal schools. Two others regulate it only for agricultural colleges, and two have laws which apply to all state institutions. Five other states have miscellaneous restrictions affecting the minimum age of entrance to various other of its institutions, and the awarding of state scholarships to candidates within fixed age limits.

CHAPTER III

DESCRIPTION OF THE COLUMBIA AND BARNARD GROUPS INCLUDED IN THIS STUDY

The following pages contain a description of the young students who, before reaching their sixteenth birthday, entered Columbia and Barnard Colleges during the period from 1921 to 1925, inclusive.

Ages and Number

Judging from the number entering each year, there appeared to be no significant trend in the enrollment statistics for the aggregation, since the proportions each year were about the same. One hundred twenty-six boys and twenty-eight girls comprised the groups and constituted 4.1 per cent and 2.6 per cent, respectively, of the total number of freshmen admitted during the period. Thirty per cent of the boys and 10 per cent of the girls entered in February at the beginning of the winter session of the colleges, the remaining numbers matriculating at the regular opening date in September.

Of the boys, two had not reached their thirteenth birthday; ten were between 14 and 15; and one hundred fourteen were between 15 and 16 years of age. The range was from 12 years 3 months, to 15 years 11 months, with the mean at 15 years 6 months and the standard deviation 8.5 months.

Three of the girls were between 14 and 15, and twenty-five entered between the ages of 15 and 16. They were, on the average, two months older than the boys, the mean being 15 years 8 months, and the standard deviation 3.8 months. Ages were taken to the nearest month for both sexes. Both groups were approximately three years younger than the average college freshman who begins his higher education at the age of 18 years 7 months.[1]

Seven of the boys were born in foreign countries; seventy-nine in New York City; and the remainder in various sections of the

[1] United States Bureau of Education, Bulletin, 1924, No. 35, p. 102.

United States. Of the girls, two were born in foreign countries; eighteen in New York City; and the remainder in four eastern states. Table IV shows the order of births.

TABLE IV

BIRTH ORDER OF THE 154 COLUMBIA AND BARNARD STUDENTS INCLUDED IN THIS STUDY

BIRTH ORDER	BOYS	GIRLS
Only child	44	10
First born	33	9
Second born	20	4
Third born	13	3
Fourth born	10	..
Fifth born	4	1
Sixth born	1	..
Seventh born	..	1
Eighth born	1	..

The girls came from families whose median number of members (counting the mothers and fathers) was 3.14, and the boys from homes having 4.56 members. The latter figure is larger than that given by Reynolds,[2] who estimated the typical American liberal arts undergraduate student as coming from families whose median size was 3.77.

Four of the brothers and sisters of the girls studied entered college at 15 years of age; one at 16; one at 17; and three at 18, while ten siblings in the boys' families became college students at 15; fifteen at 16; fourteen at 17; and eight at 18; with one each at 19, 22, and 28. There were, however, only two siblings of the same family who attended Columbia or Barnard Colleges together during the period which this investigation covered.

NATIONALITY AND EDUCATION OF PARENTS

No attempt was made to arrive at an accurate, quantitative enumeration of the nationalities represented by the students in question, since the problem entails the consideration of data which are not reliable for the purpose desired; but, in the main, the parents were mostly of foreign stock, consisting chiefly of Russian

[2] Reynolds, O. E., *Social and Economic Status of College Students*, p. 54.

and Jewish strains, with American-born Anglo-Saxons in the minority. Approximately 25 per cent of the fathers and 28 per cent of the mothers of the twenty-eight girls were found to have attended college; two of each parent in New York City, one each in Italy, and one father in Russia. Of the one hundred twenty-four boys, 26.6 per cent had fathers who had been college men, and 17 per cent were sons of college women. Fifteen per cent of the fathers had been enrolled in New York City institutions; 4 per cent in foreign countries, and the remaining number in different states. Eight per cent of the mothers had attended college in New York City; about 2 per cent in foreign countries, and the rest in states other than New York. Comparing these figures with those given by Butler[3] for Barnard College students, 34 per cent of whose fathers and 10 per cent of whose mothers had a college education, it is seen that fewer girls had fathers and a larger number had mothers with a higher education. Reynolds[4] estimates that 28 per cent of the fathers and 16 per cent of the mothers of the typical American liberal arts undergraduate have a college education; and these figures correspond approximately to those affecting both sexes of the students in this study.

Social and Economic Status

Table V shows the classification of the occupations of the parents of the 154 students concerned. The occupations were arranged in this manner to allow comparisons with Butler's report[5] of the occupations of the fathers of students who entered Columbia and Barnard Colleges during 1924. Comparisons may also be made with Reynolds' findings,[6] which showed 76 per cent of the fathers of the typical American liberal arts undergraduate to be engaged in proprietary, agricultural, professional, and managerial service.

It is seen that a larger percentage of the younger boys come from the merchant, manufacturer, engineer, salesman, teacher, and banker groups than the unselected 1924 students, and the same is true for the girls, a larger percentage of whose fathers are in the merchant, manufacturer, physician, engineer, lawyer, and the other higher professional groups. A similar condition

[3] Butler, N. M., *School and Society*, 22: 791, December 19, 1925.
[4] Reynolds, O. E., *op. cit.*, p. 56.
[5] Butler, N. M., *op. cit.*, p. 790.
[6] Reynolds, O. E., *op. cit.*, p. 54.

was found to be the case for the Barnard student body as a whole in Butler's[7] report of 1924, in which 35 per cent of the students were daughters of professional men and 63 per cent of business men. It is, then, evident that the young girls came from homes having a higher social and economic status than the young boys, and that both groups are above the social level of the typical American undergraduate in this respect.

TABLE V

OCCUPATIONS OF THE FATHERS OF THE COLUMBIA AND BARNARD COLLEGE STUDENTS

Occupation	Butler's Study	This Study	
	Columbia	Columbia	Barnard
Laborers	3.5%	3.4%	0.0%
Merchants	3.3	18.0	7.1
Lumbermen and auto industry	8.2	4.0	3.6
Manufacturers	7.3	10.1	14.2
Physicians	7.3	5.5	10.7
Real estate operators	4.8	2.4	3.6
Engineers	4.8	5.5	7.1
Lawyers	4.1	4.7	3.6
Contractors	4.1	2.4	...
Salesmen	3.7	7.1	3.6
Business executives	2.9	4.7	10.7
Superintendents, foremen, and inspectors	2.9	1.5	3.6
Farmers	2.7	2.4	3.6
Teachers	2.7	11.8	10.7
Bankers	2.4	3.1	3.6
Clergy	2.4	2.4	3.6
Other	...	4.7	3.6
Dead or retired	12.9	6.3	7.1
Total	100.0	100.0	100.00

If the replies to the questionnaire, which was returned by over 95 per cent of the 124 (approximately 80 per cent of the total number being studied) young students whom the writer was able to locate and correspond with, can be accepted as a reliable index of the median annual family income of the groups during the time they attended college, the figures are higher than those found by Reynolds in his study of the economic status of the typical college

[7] Butler, N. M., *loc. cit.*

student in the United States.[8] The median of the incomes reported by the girls was approximately $5,750, and for the boys approximately $7,750, as contrasted with the figure given by Reynolds for non-state colleges (non-coeducational) of $5,140 for the women and $4,888 for the men.

The questionnaire returns indicated that about 24 per cent of the boys and 26 per cent of the girls came from homes owned by their parents. Approximately 19 per cent of the girls and 20 per cent of the boys lived in the college dormitories while going to school, the remaining number staying at home with the exception of about 9 per cent of the boys who resided in a fraternity house, and two with friends or in a hotel. Nearly 25 per cent of the boys and 30 per cent of the girls lived a distance from the colleges which required more than ten hours per week for them to commute.

About 16 per cent of the girls and 30 per cent of the boys were partially self-supporting while in college, and less than 2 per cent of the boys were wholly self-supporting. It must be remembered, however, that these figures represent only about 80 per cent of the total number of students studied, and may or may not give a reliable indication of the status of the whole groups.

Summary

To recapitulate, the groups being considered represent about 3 per cent of the two student bodies in Columbia and Barnard Colleges. They are about 15.5 years of age, which is approximately three years less than the average entrance age of college freshmen in the United States. The majority of each sex were born in New York City or its environs and were first-born or only children. Some had brothers and sisters who likewise entered college at a young age. They came from families which, in the case of the boys, are slightly larger, but, in the case of the girls, about the same size as those of the typical American undergraduate. Their parents, in the main, were of Russian-Jewish stock; about one-quarter of them have had varying amounts of college or university instruction, which is a little higher than is found for the parents of college students over the nation. Likewise, more of the parents were found to have a higher economic status, judging from the analysis of their occupations, than is found for the parents of Columbia students as a whole or is en-

[8] Reynolds, O. E., *loc. cit.*

joyed by the average parent of undergraduate students. Similarly, according to the questionnaire returns from about 80 per cent of the total number being studied, the median family incomes were somewhat higher.

About one-quarter of the number replying to the questionnaire indicated that their parents owned their homes. A corresponding proportion lived in the college dormitories while in attendance, and about one-fifth commuted a considerable distance from their homes. About one-third of the boys and one-sixth of the girls were partially self-supporting.

The information included in this chapter has been arranged in an attempt to describe the home background of the students being studied, which might throw some light on the interpretation of the findings in the later chapters, albeit, Clark[9] believes that such factors as birthplaces of parents, their education, and the education of other children in the family, are of little significance in selecting students for college work.

[9] Clark, F. L., *School and Society*, 25: 237–38, February 19, 1927.

CHAPTER IV

FACTORS RELATED TO INTELLIGENCE TEST ACHIEVEMENT

Results of the Intelligence Tests

The following table gives the results of the Thorndike Intelligence Examination as administered to the 126 boys and 28 girls who, under sixteen years of age, entered Columbia and Barnard Colleges from 1921 to 1925, inclusive.[1]

TABLE VI

Distribution of the Thorndike Intelligence Test Scores

Score	Boys	Girls
110–114.9	1	..
105–109.9	13	..
100–104.9	12	2
95–99.9	26	2
90–94.9	22	2
85–89.9	24	7
80–84.9	15	4
75–79.9	8	6
70–74.9	1	3
65–69.9	3	2
60–64.9	1	..
Total	126	28

Measure	Boys	Girls
Mean	91.71	83.75
Q_3	98.95	91.43
Median	92.50	83.75
Q_1	85.73	76.66
S.D.	9.80	8.55
Range	61–112	69–104
$P.E._{M.}$	.60	1.15
$S.D._{S.D.}$	.61	1.18
$Diff._{M.}$	7.96	
$P.E._{diff.}$	1.32	

In commenting on the significance of the scores on the Thorndike Examination, Wood[2] states that the scores on the 1919, 1920, 1921, and 1922 series vary from 40 to 100 (occasionally going over 100). He also states that empirically a score under 60, with the applicant for admission being over seventeen years of age, would be indicative of his unfitness to pursue college work at Columbia. With a score under 60, the applicant's age being less than seventeen, he should be advised to wait one year before

[1] Data obtained from the Directors of Admissions at Columbia and Barnard Colleges.

[2] Wood, B.D., *Measurement in Higher Education*, p. 307.

again attempting entry. Students making scores of from 60 to 69 have been known satisfactorily to complete their college work if they were exceptionally industrious, and scores of 70 indicate a higher probability of success, while those students who achieve scores of 85 or higher can be safely admitted regardless of their preparation.

The data of Table VI show that four boys and two girls of the group under consideration failed to attain the critical score set by Wood, though five cases rated above the 65 mark. Incidentally both girls and one boy thus rated failed to complete their work. The Barnard girls are consistently lower than the Columbia boys, but show less variability in the ranges and sigmas of the scores. The difference of the means is, however, significant, since it is more than six times its probable error. This difference, however, does not hold for the two student bodies as a whole. With the scores of the younger students taken out, and based on the scores of 2,393 boys and 712 girls determined over a five-year period, the difference of the means is .89 times the probable error, thus eliminating the chance of significant sex differences in the unselected groups.[3]

Intelligence Test Achievement Comparisons

By comparing the central tendencies of the intelligence test scores of the young students with those of the unselected ones

TABLE VII

Thorndike Intelligence Test Scores of 2,393 Columbia and 712 Barnard Students, Not Including the Scores of the Younger Students Previously Listed

Measure	Columbia	Barnard
Mean	80.10	80.68
S.D.	11.85	10.30
$P.E._{M.}$	±.16	±.27
$S.D._{S.D.}$	±.18	±.27
Total	2,373	712
$Diff._{M.}$	.58	
$P.E._{diff.}$	.65	

[3] The data for the boys are approximately ten times as reliable as those for the girls since the reliability varies directly as the square root of the number of additional cases .

(Tables VI and VII), the boys are seen to be decidedly superior to the older students of their sex, the difference of the means being 11.61 and over 13 times its probable error. The girls, however, do not differ from the unselected group to such a great extent, the difference of the means being only 2.5 times the probable error. The mean of the boys corresponds to the eighty-fourth percentile of the unselected group, while that of the girls is only 3 points above the fiftieth percentile for their sex.

Comparing the means of the young students with those of unselected student bodies in various sections of the country, as shown in Table VIII, further accentuates their superiority in intelligence test achievement, and emphasizes the selectivity of the Columbia and Barnard groups.

TABLE VIII

Freshman Scores on the Thorndike Test in Various Colleges*

Institution	Men		Women	
	M.	S.D.	M.	S.D.
Columbia (1919)	81	13.3	..	....
Brown	76	15.0	..	....
Eastern State (Women)	..	....	74	13.3
Stanford (1921)	71	16.7	72	13.6
University of California	68	15.0	..	....
Pomona College (California)	74	14.5	71	12.2
Women's College	..	....	66	13.2
Trenton, N. J. (Normal)	..	....	64	13.0

* Wood, B. D., *Measurement in Higher Education*, p. 44.

In every case the means of the younger students exceed those of the unselected and older students throughout the country, and the variability of the scores is less. With the number of cases in the latter groups unavailable, it is, however, impossible to determine the significance of this difference or the reliability of the measures shown for the unselected groups.

Correlation of Variables Employed

Although correlations involving a group so severely restricted as this one are correspondingly restricted in meaning and amount, an attempt was made to find relationships among certain varia-

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bles, in so far as they may apply to young students of 12 to 16 years of age.

Table IX shows the intercorrelations obtained from the Columbia and Barnard students in question. The intelligence variable is represented by the raw score obtained from the Thorndike test of each student. The age is expressed in months to the nearest number of days. The physical variable is unsatisfactory but was thought to be the best measure available with the data at hand. It consists of an index of robusticity [4] obtained by subtracting

TABLE IX

INTERCORRELATIONS BETWEEN VARIABLES SHOWN FOR 154 COLLEGE STUDENTS UNDER SIXTEEN YEARS OF AGE

VARIABLE	2. INTELLIGENCE		3. PHYSICAL RATING	
	Boys	Girls	Boys	Girls
1. Age	−.126±.060	−.028±1.23	.048±.061	.299±.112
2. Intelligence			−.161±.060	−.162±.120
3. Physical				
4. Social				

VARIABLE	4. SOCIAL RATING		5. SCHOLASTIC RATING	
	Boys	Girls	Boys	Girls
1. Age	.042±.061	−.012±.123	−.048±.061	.100±.121
2. Intelligence	−.008±.061	.233±.117	.394±.051	.601±.078
3. Physical	.080±.061	−.252±.114	.078±.061	−.271±.113
4. Social			.051±.061	.424±.101

from the height in centimeters, the sum of the weight in kilograms and the chest measure at expiration (I = H − (W + C). Likewise the social variable is recognized as being of questionable validity as it considers only the number of extra-curricular activities participated in by the student during his college career. The fifth variable is more objective and represents the average number of grade points earned by each student. In determining these, a value of 3 points was assigned to each credit of "A"; 2 for each credit of "B"; and 1 for each credit of "C." "D" grades re-

[4] Bovard, J. E. and Cozens, F. W., *Tests and Measurements in Physical Education*, p. 67.

ceived no credit, and each point or credit of "F" quality bore the value of −1. With the age distribution being skewed downward, the value of the coefficients obtained by correlating age with the other variables is questionable; however, a small negative correlation of −.126±.060 and −.028±.123 between age of entry and intelligence test score is observed for both boys and girls, indicating no significant relationship between the two. This is somewhat in accordance with the findings of other investigators, although Odell[5] found it to be −.53; Garrison[6] discovered no reliable relationship with North Carolina State College students; Terman[7] found a marked negative correlation; and Wilson obtained a coefficient of −.123±.041 between age and index of brightness. The probable error is so great in the case of the younger Columbia and Barnard groups that nothing more than a chance relationship can exist.

The same is true with the coefficients between age and the physical ratings, where coefficients of .048±.061 and .299±.112 were found for boys and girls, respectively. It is not probable that a correlation would be found between these two variables in any group, since the index used is subject to so many influences.

In the case of age and social-rating relationships, the probable error of the coefficients found is again too large to permit definite conclusions to be drawn, but it is evident that with the group in question, age seems to have no effect on the number of extra-curricular activities participated in. Likewise, it does not appear to affect academic achievement, since the coefficients for these two variables are extremely low and have large probable errors.

The correlation between age and scholarship is also significantly low. Coefficients of −.048±.061 for the boys and .100±.121 for the girls indicate the independence of these variables and may be compared to −.048 and −.016 as found by Gowen[8] with University of Maine students; and .09±.01 and .19±.02 as found by Forsyth[9] with 1,306 men and 644 women at the University of Illinois.

Similarly, little relationship is observed between intelligence,

[5] Odell, C. W., *University of Illinois Bulletin*, Vol. 24, No. 36, p. 42.
[6] Garrison, K. C., *School and Society*, 28: 631, November 17, 1928.
[7] Terman, L. M., *The School Review*, 32: 407, June 1924.
[8] Gowen, J.W. and Gooch, M. E., *Mental Attainments of College Students in Relation to Previous Training, Environment, and Heredity*, p. 33.
[9] Forsyth, C. H., *Journal of Educational Psychology*, 3: 164, March 1912.

index of robusticity, and the number of extra-curricular activities engaged in. The girls have a higher correlation than the boys between their intelligence test scores and scholastic success. The obtained coefficients of .601 ± .078 and .394 ± .051 for the girls and the boys, respectively, between intelligence and academic achievement may be compared with those obtained at other institutions from unselected groups as follows: Iowa State College .64 ± .06 and .51 ± .08; University of Wisconsin .36 ± .05; Brown University .37 and .53; Stanford University .53; University of Chicago .41; University of South Dakota .27; and University of California .38; [10] Rogers [11] reports coefficients of .61, .45, .37, and .38 between the Thorndike intelligence tests and academic marks for the first, second, third, and fourth years of college work, respectively. The coefficient of the Columbia boys compares favorably with these figures, but that obtained for the girls is somewhat higher, in fact, considerably higher than that [12] found by Wood to exist for the Barnard class of 1926, namely .347 ± .046.

Galton [13] could determine no relationship between the academic ratings and physical measurements of 2,000 students at Cambridge, and a later investigator, Brooks,[14] found little correlation between the age, height, weight, strength, and intelligence measurements of university men and normal school women, while Garrett and Kellog [15] obtained small and unreliable correlations between measures of height-weight ratios, social and abstract intelligence, and emotional instability among 221 Columbia College freshmen. The same condition was found to exist with the local group, as evidenced by the low and negative correlations between physical, social, and scholastic ratings, indicating the lack of relationship between those factors and the futility of attempting to draw conclusions from them.

The greatest difference between the coefficients pertaining to each sex is found with the social and scholastic comparison, where the correlations are .051 ± .061 for the boys and .424 ± .101 for the girls, showing the tendency of the scholars in the latter group

[10] Compiled by Nelson, M. J. and Denney, E. C., *School and Society*, 26: 501, October 15, 1927.

[11] Rogers, A. L., *British Journal of Psychology*, 15: 410, November 29, 1924.

[12] Wood, B. D.; from a report made to the Director of Admissions at Barnard College.

[13] Galton, F., *Proceedings of the American Association for the Advancement of Physical Education*, 6: 51–57. 1891.

[14] Brooks, F. D., *Journal of Applied Psychology*, 12: 228–41, 1928.

[15] Garrett, H. E. and Kellogg, W. N., *Journal of Experimental Psychology*, 11: 113–29, April 1928.

to participate to a greater extent in extra-curricular activities than the boys. The probable errors of these coefficients are large enough, however, to warrant scrutiny of conclusions.

The partial correlations of the five variables being discussed—(1) age, (2) intelligence, (3) physical, (4) social, and (5) scholastic—were calculated after the decision was made not to test the relationships for linearity due to the coefficients of correlation being so small, and the improbability of materially affecting the interpretation even if the relationships were found to be non-linear and the correlation ratio applied. The following partial correlations were calculated for the boys only, since with so few cases of the Barnard students, the additional calculations would be of little value beyond what is already known.

$$r_{15 \cdot 234} = .005$$
$$r_{25 \cdot 134} = .410$$
$$r_{35 \cdot 124} = .150$$
$$r_{45 \cdot 123} = .048$$

These correlations bring out more clearly the relationships involved. There is practically no correlation between age and scholastic achievement with the factors of intelligence, the index of robusticity, and extra-curricular participation held constant or eliminated, while the influence of age, index of robusticity, and extra-curricular participation on the correlation of intelligence and scholastic success is negligible. With age, intelligence, and social factors partialed out, the relationship between the index of robusticity and scholarship is not materially changed, nor is that of extra-curricular activities and scholarship, with the influence of age, intelligence, and robusticity eliminated.

This indicates that intelligence is the best of the five factors considered to predict the academic success of the young students in question, and that given the intelligence test score of the young applicant, his probable scholastic success as measured by grades or marks can be predicted practically as accurately as it can be with the other four measures taken singly or combined with intelligence. As final proof of this, the multiple correlation,

$$R_{5 \cdot 1234} = .421 \pm .033 \ \sigma\text{est.},$$

was calculated from the preceding data, supporting the previous statements and pointing to the difficulty met in attempting to

measure objectively the influences other than native ability which enter into the adjustments that every student, young or old, has to make in pursuing a career in a higher institution of learning.[16]

Summary

To review the contents of this chapter, the boys of the group in question achieved significantly higher intelligence test means than the girls, although no sex differences were found in the mean scores of the Columbia and Barnard student bodies taken as a whole. The boys who entered Columbia College under sixteen years of age were decidedly superior to the older students of that institution, but it is questionable whether the girls possessed such a distinction when compared with the older Barnard students of their sex.

The means for both sexes of the younger students exceeded the means of unselected student bodies in seven other institutions over the nation, where the Thorndike intelligence test had been administered.

Low and negative correlations were found between age, intelligence, physical, social, and scholastic ratings, the variables showing the most definite correlation being intelligence, and scholastic ratings. For prediction purposes, and using scholastic achievement as the criteron for success in college, the intelligence test score was found to be the most satisfactory of the measures employed in studying the Columbia and Barnard groups.

It is to be emphasized that the correlation coefficients thus obtained show only what is true for college students who have passed their twelfth but have not reached their sixteenth birthdays, and that correlations including the total range of age for the students in the colleges involved might well bring out different degrees of relationship among the variables treated.

[16] Herriot, M. E., *Attitudes as Factors of Scholastic Success*, p. 44.

CHAPTER V

SCHOLASTIC RECORDS OF THE COLUMBIA AND BARNARD STUDENTS

Secondary School Preparation

Eighty-four per cent of the boys and 64 per cent of the girls included in this study entered college from public high schools, for the most part situated in the metropolitan area. Fifteen per cent of the boys and 32 per cent of the girls had their secondary school preparation in private and parochial institutions, and one of each sex had instruction from private tutors. Thirty-four boys (26 per cent) graduated from Townsend Harris Hall, a public, three-year, college preparatory institution, affiliated with the College of the City of New York.

Butler,[1] in reviewing the situation with the students entering Columbia and Barnard in 1924, stated that two-thirds of the girls and 59 per cent of the boys were trained in public high schools, and 33 per cent of the girls and 17 per cent of the boys in private secondary institutions, the remaining numbers being admitted to advanced standing from other colleges. Thus a larger percentage of the younger boys, but about the same proportion of the younger girls, came from public high schools as was the case with the 1924 enrollments of the two colleges. This means that a smaller proportion of the younger boys had private instruction before being admitted to Columbia than did the entire freshman class of 1924.

Over 99 per cent of the younger students graduated from the high school which they entered as freshmen, and remained to complete their secondary school preparation. The average number of high school units offered for admission by the boys was 16.1, with a range of from 12 to 22.5 and a standard deviation of 1.5. The mean number and range of high school units submitted by the girls was less than that for the boys, being 15.7, with a range of from 15 to 17 and a standard deviation of 6. Fourteen per cent of the girls were admitted with technical

[1] Butler, N. M., *School and Society*, 22: 788–91, December 19, 1925.

conditions, all of them having the required number of high school units but lacking a specified subject or sequence which was required for admission to Barnard. The average percentage of all freshmen entering that college with conditions from 1921 to 1926 was 29,[2] showing the younger girls to be less handicapped in this respect than the freshmen as a whole. A somewhat larger percentage of the boys was admitted with entrance conditions, 19 per cent having deficiencies of the technical nature mentioned for the girls. It is estimated [3] that from 25 to 30 per cent of the Columbia freshmen have deficiencies of this type, which indicates that the younger group was better prepared to meet the entrance requirements at Columbia than is the average freshman student. Concerning this, Jones [4] is of the opinion that the poorer type of student is apt to enter college with two or more conditions in high school units, and Rogers [5] found the students who came to Goucher College with conditions to be as a group inferior in intelligence, and less certain to graduate, with over one-half of their number leaving college before they had completed the graduation requirements.

Scholarships

The state of New York provides for the award each year of five scholarships for each Assembly District. These scholarships are of an annual value of $100 to be applied toward the tuition charges of any approved college within the state, which the successful candidate may select. They are awarded on the basis of the examinations of the State Education Department. Thirty-nine of the boys and three of the girls were granted these scholarships on the basis of their high school work and the State Department examinations. This number constitutes approximately 24 per cent of the total number awarded to Columbia students from 1921 to 1926. In addition to the state scholarships, many others were available in the two colleges, but most of them were intended to furnish financial relief to deserving students, rather than as an award solely for academic achievement. One of the younger boys was awarded the Alumni Competitive Scholarship, amounting to $250 and given each year to the freshman who,

[2] From data obtained at the Admissions Office, Barnard College.
[3] Estimate furnished by the Admissions Office, Columbia College.
[4] Jones, E. McL., *Student Personnel Work at Northwestern University*, p. 156.
[5] Rogers, A. L., *Educational Administration and Supervision*, 10: 395–98, September 1924.

in the opinion of the Director of Admissions, has the best entrance record. Eight other boys and two girls won various scholarships, for the most part the recognition of academic excellence.

Scholastic Achievement

In considering the scholastic grade averages of the two groups, the average grade points earned by each student[6] were determined and arranged in such a way that the following comparisons could be made.

Table X shows the distribution of grade points by ages and sexes. Numbers do not allow reliable comparisons to be made between the achievements of students of different ages, but it may be stated that students younger than fifteen are no more

TABLE X

Distribution of Grade Points by Ages and Sexes

Grade Points	Boys' Ages						Girls' Ages			
	12		14		15		14		15	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
2.50–2.99	..	..	..	..	6	5	..	..	3	12
2.00–2.49	1	50	5	50	30	27	1	33	6	24
1.50–1.99	1	50	2	20	53	47	1	33	9	36
1.00–1.49	..	..	3	30	19	16	1	33	7	28
.50– .99	..	..	..	..	5	4	..	..	..	..
.00– .49	..	..	..	..	1	1	..	..	..	..
Total	2	..	10	..	114	..	3	..	25	..

conspicuous for lower standing than those between fifteen and sixteen. The average number of grade points earned by all the boys was $1.75 \pm .04$, with a range of from 0.12 to 2.80 and a standard deviation of $.47 \pm .03$. The approximate average of the Columbia College student body is the equivalent of 1.20,[7] and while the variability of this score is not available, it is safe to conclude that the younger boys have a higher rating. The figures in Table X may be compared with the average of the young girls which was $1.78 \pm .09$, with a range of from 1.00

[6] Determined by assigning a value of 3, 2, 1, 0, and –1 for each credit of A, B, C, D, and F work, respectively.

[7] Obtained from the Registrar's Office, Columbia College.

to 2.96 and a standard deviation of .47 ± .06. Unfortunately, no average for the Barnard students as a whole was available for comparison purposes, but it will be seen that their average is somewhat higher than that of the younger Columbia boys. This difference between the sexes, however, is not significant, since the probable error of the difference is greater than the difference itself.

Major Scholastic Interests

Table XI indicates the fields of activity in which the Columbia and Barnard groups were occupied while carrying on their

TABLE XI

Division Course Count and Average Grade in Each Division

Division	Number		Average Grade	
	Boys	Girls	Boys	Girls
History, economics, public law, and social science	126	28	1.63	1.72
Modern language and literature	126	28	1.61	1.65
Education and practical arts	124	28	1.22	1.87
Mathematics and physical sciences	119	27	1.69	1.26
Philosophy, psychology, and anthropology	84	24	1.79	1.83
Chemistry	63	11	2.10	1.53
Fine arts	42	3	1.84	2.67
Geology and mineralogy	40	1	1.93	1.00
Biology	39	22	2.08	1.92
Law (private)	22	0	1.57	....
Business	21	1	2.22	1.66
Music	19	7	1.65	2.61
Engineering	17	0	1.89	....
Ancient and oriental language	11	14	1.17	2.23
Medicine	6	0	2.14	....
Mining and metallurgy	5	0	1.17	....
Journalism	3	1	1.90	....

studies, as well as the grade point average for each sex in the division shown. The boys seem to have achieved more than the girls in the fields of chemistry, biology, business, and geology, and the girls appear to have been more successful in all other fields in which they competed with the boys. However, the reliability of these differences was not determined, since it was found that there was no significant disparity between the total

averages of the two sexes. Included in the Modern Language and Literature Division were such courses as English, French, German, and Spanish, and all of the physical education courses were listed in the Education and Practical Arts Division. This accounts for the large number of students who pursued work in these divisions, and renders the other divisions more self-explanatory.

Time Required for Graduation

The graduation requirements of Columbia and Barnard Colleges call for the completion of 124 semester points of work, including certain specified subjects and sequences of subjects. The twenty-two girls who graduated did so with an average of 131.1 points. One girl attended 8 semesters and 2 summer schools (6 weeks each); three for 8 semesters and 1 summer school; thirteen for 8 semesters; three for 7 semesters and 2 summer schools; one for 7 semesters and 1 summer school; and one for 7 semesters; albeit in only two cases was it necessary for the students to be in attendance longer than 8 semesters to secure the necessary credits to graduate. For the one hundred six boys who entered as freshmen and received the Bachelor's degree, the average number of credits offered for graduation was 133.8. Two boys were in attendance 8 semesters and finished their work by extension courses because of financial difficulties during their time in residence. One was required to attend 3 summer schools, in addition to the 8 regular semesters, because of credit deficiencies. Two spent time in attending 2 summer sessions, and ten attended 1 summer school beyond the 8 regular semesters in order to take work in which they were especially interested, but which was not required of them. Forty-seven graduated in 8 semesters; one in 7 semesters and 3 summer schools; six in 7 semesters and 2 summer sessions; thirteen required only 7 semesters and 1 summer school; while twelve completed their work in 7 semesters. Four were in attendance for 6 semesters and 2 summers; five for 6 semesters and 1 summer; and 3 completed the requirements in 6 semesters.

Academic Mortality

In summary, 78 per cent of the young girls and 79 per cent of the young boys successfully completed their undergraduate work

in eight semesters or less, which is decidedly better than the performance of the average Columbia and Barnard student bodies. Butler [8] reports that 72 per cent of the entering freshmen of Columbia received the A.B. or other degree at the end of the four years, compared to about 30 per cent of the A.B. candidates in many Eastern and Western universities.

In a recent study [9] made of the situation at Barnard College, it was found that 67 per cent of the 477 freshmen entering that institution from 1918 to 1921 received the A.B. degree up to 1926, and a considerable portion of these spent more than four years obtaining it. Hammond [10] reported only 37.5 per cent of the students entering engineering courses in American technical colleges and universities as being graduated. Toops [11] found that only 35 per cent of 1,958 students entering Ohio State University in the autumn quarter of 1923 completed the fourth year, and only 18.1 per cent graduated in fifteen calendar quarters. Hudelson [12] calls attention to a study made of 1,672 students entering the University of Minnesota in 1920. Twelve and eight-tenths per cent of this number graduated in four years from the college of their original matriculation; 11.1 per cent graduated or completed four years of work in pre-professional and professional curriculums, and 0.6 per cent graduated in four years after transferring to another college of the university.

Doerman,[13] in quoting from Koos's study, states that the percentages of students reaching the fourth year in ten Eastern, and thirteen Mid-Western colleges were 66.1 and 43.5, while the returns from three Mid-Western universities showed only 54 per cent reaching the senior year. Other writers, Rogers,[14] Smith,[15] and Book,[16] all report academic mortality statistics for various other institutions, which are considerably higher than those for the Columbia and Barnard students in question.

Table XII shows the reasons for the younger students not com-

[8] Butler, N. M., *School and Society*, 22: 790, December 19, 1925.

[9] Achilles, E. M., "Student Survival at Barnard College." A report on file at the Admissions Office.

[10] Hammond, H. P., *National Conference for Social Work*, pp. 613–17, 1926.

[11] Toops, H. A., *Academic Progress*, p. 133.

[12] Hudelson, E. (editor), *Problems of College Education*, p. 98.

[13] Doerman, A. J., *Orientation of the College Freshman*, p. 82.

[14] Rogers, A. L., *Educational Administration and Supervision*, 12: 149, March 1926.

[15] Smith, C. A., *Educational Administration and Supervision*, 9: 341, September 1923.

[16] Book, W. F., *The Intelligence of High School Seniors*, p. 161.

pleting their work, and the percentage may be compared with results of similar studies indicated by the author's name to which reference is given in the footnotes.

TABLE XII

PERCENTAGES OF REASONS FOR STUDENTS LEAVING COLLEGE

REASON	BARNARD	COLUMBIA	ROGERS *	SMITH †		JONES ‡	
	6 Cases	19 Cases	100 Cases	Men 446	Women 350	Men 17	Women 44
None	16.6	42.1	21.2	....	....	....	....
Poor work	16.6	21.0	8.2	....	....	....	....
Transfer	33.3	5.3	1.9	14.2	22	11.8	47.7
Conduct	....	....	1.6	....	....	....	....
Health	....	....	1.6	18.1	26.5	....	4.5
Marriage	....	....	1.6	1.0	13.5	5.8	6.8
Financial	16.6	5.3	1.6	45.1	27.2	58.8	13.6
Family	....	....	.78	....	3.4	17.7	9.3
Leave of absence	16.6	15.7	....	1.0	....	....	....
Death	....	5.3	.78	3.6	1.1	....	....
Other	....	5.3	....	18.0	6.3	5.8	18.1

* Rogers, A. L., *op. cit.*, p. 148.
† Smith, C. A., *op. cit.*, p. 342.
‡ Jones, E. McL., *Student Personnel Work at Northwestern*, p. 62.

The differences between the frequency of reasons for college student mortality can obviously be attributed to the varying intellectual, social, and economic influences at play in the various environments of the students, together with many other factors which make quantitative comparisons hazardous. However, a larger percentage of the young boys seem to have been eliminated by unknown causes and scholarship, than of the girls, who, on the other hand, appear to have been affected more by transfers and financial difficulties, accounting possibly for the number being granted leaves of absence. Both sexes show relatively smaller proportions being influenced by conduct problems, health, marriage, family, and other difficulties; but, of course, numbers again invalidate any conclusions which might be drawn on these points.

Of the twenty-four boys who exercised the professional school option in the fourth year of their liberal arts preparation to become law students, thirteen graduated with the LL.B. degree; two failed; and the nine others are still in attendance and will, according to the information available, not add any

numbers to the failures. Of the five who entered the Medical School at the beginning of their fourth year in college, three have completed the requirements for the M.D. degree; one is practicing medicine in New York City; and the other two are serving their interneships in hospitals. One boy is successfully pursuing the course of study in the School of Dentistry.

Ten boys entered the School of Mines at the beginning of their senior year, and of this number four have graduated. The remaining six are still enrolled and are making satisfactory progress. Five became students in the School of Business; three of these received the B.S. degree after completing their work in the usual required time, and the other two are still in attendance.

Only one of the young girls entered a professional school, namely, that of journalism, in which she is still studying. Thus, a larger percentage of the young boys undertook professional training than did the opposite sex.

With 35 per cent of the boys entering professional schools at the commencement of their fourth year in college, and 95 per cent of these either graduating or being reasonably certain to graduate, it is apparent that the group in question are far more successful than the professional or technical school students at large, of whom, according to Hammond's figures,[17] only 37.5 per cent are successful enough to complete the graduation requirements.

Academic Honors

That the younger students of Columbia and Barnard Colleges achieved academic honors and recognition in excess of their proportionate numbers, is evidenced by the fact that nearly 16 per cent of the boys and over 21 per cent of the girls were elected to Phi Beta Kappa in their senior year. The percentage elected from the two student bodies at large varies from 8 per cent to 10 per cent according to the figures of the faculty advisers of the local chapters. Ten and three-tenths per cent of the boys and 3.6 per cent of the girls graduated with general honors compared to 3.1 per cent of the other graduates of the two colleges during the same period; while 2.3 per cent of the boys and 10.7 per cent of the girls were awarded honors in special subjects at graduation compared to 1.4 per cent of the older students.[18] In addition, two

[17] Hammond, H. P., *op. cit.*

[18] Data compiled from the Commencement Programs of 1925 to 1929, inclusive.

girls were granted a graduate fellowship and scholarship, respectively.

Smith[19] states: "If a student belongs to the highest tenth of his class, in general to the group marked excellent, his chances of achieving a career in life distinguished by the approval of his fellow men are forty times as great as they are on the average, if he belongs to the lower nine-tenths, and the probabilities of his name being found in *Who's Who* will be fifty times as great."

Tatlock [20] found 24 per cent, 25 per cent, and 40 per cent of the honor graduates of Pennsylvania, Yale, and Harvard, respectively, during the years 1893 to 1898, 1896 to 1898, and 1891 to 1900, to be listed in *Who's Who.*

Starch,[21] in summarizing several investigations, found that twenty-three successful men in Harvard's class of 1894 had 169 A's compared to the 56 A's of twenty-three members of the same class who had not won distinction in after life. Also, of the Wesleyan alumni from 1860 to 1889, 50 per cent of the honor graduates were listed in *Who's Who* in comparison with 10 per cent of the non-honor graduates. Thirty per cent of the Phi Beta Kappas were in *Who's Who* compared to 11 per cent of the non-Phi Beta Kappas. Starch mentions the fact that 56 per cent of the Yale valedictorians were in *Who's Who,* and of the living graduates of twenty-one colleges 5.9 per cent of the honor scholars and 2 per cent of all graduates were so listed.

It cannot be stated that the factors making for the later success of the honor groups just reviewed are the same that are at play in the Columbia and Barnard student bodies. However, considering the evidence found on the relation of age at graduation to the type of success mentioned, it is reasonable to assume that, in the main, college students graduating with honors at a younger-than-average age have had the native ability to succeed with their college work in spite of their youth; they will begin their economic careers earlier in life; and, if the intelligence which they possess can be the means of their making recognized contributions to economic and social progress, then the chances appear greater for them to be successful.

[19] Smith, C. A., *op. cit.*, p. 529.
[20] Tatlock, J. S. P., *School and Society*, 15: 645, June 10, 1922.
[21] Starch, D., *Educational Psychology*, p. 193.

Summary

Reviewing the material of this chapter, it was found that a larger proportion of the young students being studied entered college from public high schools than did the student bodies of which they were a part. The boys as a group became freshmen with more high school credits than the girls, although both groups had more quantitative units than were required and fewer technical entrance deficiencies than the older students. Each sex had a significant number of state scholarship holders in their groups, and several members of the groups being studied were granted other scholarships after they had been admitted to college.

No significant scholarship differences were found to exist between ages, sexes, or subjects among students entering under sixteen years of age, but the Columbia boys had a higher scholastic average than their classmates as a whole. Both groups graduated with more credits and in less time than was taken by the older students in the same and other institutions, and likewise the mortality percentages were distinctly less. Similarly, in proportion to their numbers, more were graduated with honors and given other academic recognition, and with certain limitations it was deduced that their chances for success in later life were better than those of the average or mediocre student.

CHAPTER VI

PHYSICAL MEASUREMENTS AND COMPARISONS AMONG THE COLUMBIA AND BARNARD STUDENTS

Procedure

In dealing with the physical condition of the Columbia and Barnard College groups, it may be mentioned that all regular students admitted to these institutions are required to present evidence of their physical fitness before they are matriculated. This probably results in the groups being more highly selected, in regard to physical status, than a sampling of a similar number chosen from the general student population. It also eliminates individuals who might be suffering from the more serious disorders, with the resulting probability of such defects being few, if any, in the groups considered.

Where the lack of satisfactory norms and standards for the host of factors involved did not permit desirable comparisons to be made, controls for each sex were established by choosing at random an equal number of physical records of students who entered and who were in attendance at the colleges in question during the same periods as the students who enrolled before their sixteenth birthday.[1] This obviously allows comparisons to be made between the young group and an equal number of unselected students only, and renders conclusions drawn subject to the limitations set by selectivity and random sampling.

Every available source concerning the factors to be analyzed was exhausted to obtain as complete a medical history of the students during their years in college as was possible, and the results of histories and examinations for the whole period spent in college were treated quantitatively where permissible.

In considering the stature of the selected and the control groups, the weight-height-age tables of Baldwin and Wood[2]

[1] Records were secured by choosing at random names from the alphabetical registration files, for the years in question.

[2] Baldwin, B. T. and Wood, T. D., *Tables for Boys and Girls of School Age.*

were utilized with the belief that they were the best available, since they were determined from the measurements of city children with good heredity and environmental advantages, with school medical inspection, directed play, physical training and instruction in hygiene, and with a large percentage of foreign parents. The height and weight measurements of each of the Columbia and Barnard students were expressed in inch-pound units of deviation from the average height and weight for their ages to the nearest birthday. In most cases two measurements, taken at intervals of from one to three years, were available for the boys, and three for the girls. The deviation from the norm at each examination was determined and these deviations later changed into average deviations by dividing their algebraic sum by the number of measurements made on each individual. The average deviations of each student were then added and divided by their number to obtain the average for their group.

Height and Weight

In the case of the boys, the young group's average deviation from the norms for their ages was plus 1.96 pounds in weight and plus .77 inches in height, compared to minus .06 pounds in weight and plus .12 inches in height for the control group. With the girls, the average deviation for the young group was plus .47 inches in height and plus 2.29 pounds in weight, as contrasted to plus .02 inches and 1.16 pounds, respectively, for the control group. The younger boys were on the average 1.84 inches shorter and 14 pounds lighter than the control group, irrespective of age, while the girls lacked .86 inches and 8.41 pounds of being as tall and as heavy as the members of their control group. The standard deviation in height and weight, disregarding norms, for the younger group was 2.64 inches; 1.62 inches; 8.06 pounds; and 6.75 pounds for boys and girls, respectively, compared to 2.81 inches; 1.76 inches; 9.11 pounds; and 7.23 pounds for boys and girls, respectively, of the control group.

The selected and control groups were examined under the same conditions within a few days of each other and by competent examiners in all cases. There was a difference of 27.2 months between the average entrance ages of the two groups of boys and 24.6 months between those of the girls. The proportions, on

the basis of the national derivation of the parents, were about the same between the selected and the control groups.

Other Criteria of Physical Fitness

Table XIII gives the number of each group by sexes, who, by their own testimony, had suffered from the diseases listed before they were admitted to college. The more common diseases of

TABLE XIII

Frequency of Diseases Contracted before College Entry

Disease	Young Group		Control Group	
	Boys	Girls	Boys	Girls
Indigestion	12	4	15	7
Scarlet fever	13	11	12	15
Constipation	10	7	9	6
Diphtheria	8	2	11	..
Typhoid	4	..	3	2
Rheumatism	3	..	1	..
Pleurisy	2	..	..	2

childhood are not included in the list, because complete information regarding them was not available.

It is evident that indigestion, scarlet fever, constipation, and diphtheria were the diseases most frequently mentioned, and while no sweeping conclusions can be drawn because of the method by which the data were secured, it appears that the girls had contracted fewer diseases than the boys, and that the young groups, on the whole, had suffered no more than the unselected groups.

The same is true of the number of students in each group who had undergone surgical operations, as shown by Table XIV. Here the proportions are about the same as were found for the diseases, with the younger students appearing to have needed this type of medical attention to a not much greater extent than the older students. Tonsils, adenoids, and appendicitis were the chief annoyers, occurring, in the main, slightly more frequently in the younger group, while chance cases of hernia, mastoid, feet, ear, gland disorders, and pleuritis were reported

by the younger boys and not by the older ones. One more case of tonsillectomy was reported by the younger girls than by the older girls, while the latter group underwent one more appendicectomy.

TABLE XIV

OPERATIONS UNDERGONE UP TO THE TIME OF COLLEGE ENTRANCE

OPERATION	YOUNG GROUP		CONTROL GROUP	
	Boys	Girls	Boys	Girls
Tonsils	32	8	36	7
Adenoids	16	2	13	3
Appendicitis	8	..	7	2
Hernia	4	..	1	..
Mastoid	2	..	1	..
Flat feet	1	..	..	..
Ear	1	1	..	1
Glands	1	..	..	..
Pleuritis	1	..	..	..
Teeth	0	0	1	0

Table XV gives the frequence of minor physical defects revealed by the periodical examinations given both the young and the control groups at different times during their college attendance. The boys, for the most part, were examined during their freshman and sophomore years and the girls during their freshman, sophomore, and senior years. The irregularities shown represent deviations from what the examining physicians considered to be normal, but not to the extent of seriously interfering with the academic activities of the student.

More of the boys in the control group were suffering from skin conditions, such as color, eruptions, or fat, than were those in the young group, while the number of cases reported for both groups of girls was the same. Head, spine, shoulder, chest, and abdomen deviations were all posture defects of varying degrees, possessed by about 60 per cent of the Columbia and Barnard student bodies as a whole, according to information given by the physical education authorities at those institutions, and resulting from diet, poor posture habits, and environmental factors. The younger groups, on the whole, cannot be said to have poorer postures than the control groups, judging from the

number of defects listed, albeit it is recognized that numbers alone are not a reliable index of this condition.

TABLE XV

PHYSIOLOGICAL IRREGULARITIES

IRREGULARITY	YOUNG GROUP		CONTROL GROUP	
	Boys	Girls	Boys	Girls
Skin	4	3	7	3
Head	53	12	41	8
Spine	48	8	39	8
Shoulder	69	7	72	10
Chest	35	5	46	8
Abdomen	20	3	23	4
Feet	73	14	69	17
Legs	4	0	1	0
Heart	2	2	3	1
Lungs	2	2	0	2
Nose	7	2	9	4
Throat	2	4	18	1
Teeth	12	4	15	4
Ear	3	2	7	5
Eyes	50	6	42	8
Menstruation	..	5	..	3
Total	384	77	392	86

A surprising number of both groups had foot disorders consisting chiefly of varying degrees of flat feet, and a smaller number of cases of weak ankles. According to the physicians at the colleges this condition is due, for the most part, to the city pavements and improperly-sized footwear. Four more of the young boys were found to have this difficulty than did the members of their control group, while about the reverse is true for the young girls. Abnormalities of the legs, heart, lungs, and nose show small differences in frequency of occurrence between the young and control groups, although the boys in the control group had attention called to throat conditions nine times oftener than did those in the young group. Nothing significant is noted in teeth comparisons, but a large number of both groups fail to have completely normal vision, eight more being in the young group than in the control group. Menstruation irregularities were experienced by two more of the younger girls than of the older.

Physical Education Tests

A more objective comparison of the physical condition of the young girls is to be had from their scores on the Medical Test for College Women arranged by Agnes R. Wayman, Professor of Physical Education, Barnard College. This test has been standardized with 1,000 cases, and the average scores for each class entering Barnard are also available. The score is expressed in points depending on the values assigned to the height-weight ratio; condition of the heart, lungs, menses, bowels, eyes, teeth, nose and throat, skin, glands, posture, feet, and hygiene of the body of each individual student. The maximum possible score is 150 points.

The medical scores of the young girls averaged 3.48 points above the normal score for college freshmen, and 1.25 points above the average of the freshman classes with whom they entered college. No medical tests of such a nature were available for the Columbia boys.

In addition to the medical test, anthropometric and motor ability tests were also administered to the Barnard College girls. The anthropometric test measures lung capacity, chest expansion, ninth-rib expansion, and strength of grip. It has a maximum possible score of 40 points, the normal score of college freshmen being 18 points. The young girls were, on the average, 2.7 and 1.60 points, respectively, below the norms for college freshmen of their sex and the average of the freshman class of which they were members. This is to be expected, since they were on the average about three years younger than the students from whose measurements the norms were determined. However, with the motor ability tests, involving the running high jump, basket ball throw, pole vault, rope climbing, boom walking, tumbling, and gymnastics, and having a maximum possible score of 75 points, with a norm of 32 points, the young group achieved an average score of 4.7 points above the norm and 0.6 points above the average of their classes.

An unstandardized strength test, arranged by the Columbia College staff in physical education and consisting of measures of lung capacity, strength of forearms, back, legs, and upper arms, with a maximum possible score of 1,000 points, was administered to the students entering that institution, but no norms

of any kind were ever determined. However, by comparing the average score of the young group with that of the control group, the former group was found to be inferior in strength to the extent of 41.46 points, the average scores being 531.36 and 572.82 points, respectively. Again, over two years being the difference in the average ages of the two groups, this disparity was to be anticipated.

Athletic Participation

The athletic activities of the young and control groups, presented in Table XVI, are those activities which were voluntarily

TABLE XVI

Athletic Activities of the Young and an Equal Number of Older Students Chosen at Random

Activity	Young Group		Control Group	
	Boys	Girls	Boys	Girls
Inter-class				
Crew	9	..	3	..
Football	7	..	6	..
Wrestling	4	..	2	..
Baseball *	4	2	2	3
Basket ball	3	3	1	2
Swimming	3	4	1	3
Water polo	3	..	1	..
Tennis	2	2	1	1
Fencing	1	..	..	..
Cross-country	1	..	2	..
Varsity				
Crew	3	..	1	..
Water polo	3	..	1	..
Baseball	2	2	1	1
Cross-country	1	..	1	..
Tennis	1	..	..	..
Track	1	2	3	1
Fencing	1	..	..	..
Swimming	..	2	..	1
Intramural				
Track	4	..	8	..
Fencing	2	..	1	..
Tennis	1	..	..	..
Swimming	..	4	..	2
Dancing	..	5	..	4
Total activities	56	26	35	18
Students participating	30	17	27	11
Won letters	2	1	1	0

* Indoor baseball for the girls.

participated in, in addition to the regular physical education program which is required of all students unless excused by reason of physical disability. In inter-class activities, both boys and girls in the young groups engaged in more sports than did the members of their control groups. The same is true for varsity and intramural sports, and in considering the totals it will be seen that a larger number of each sex in the young groups participated in more athletic activities, and won more recognition as measured by being awarded the college letter, than did the older students comprising the control group.

Summary

In summarizing, it may be stated that the younger students were above the age-height-weight norms to a greater extent and showed less variability in height and weight than a similar number of older students selected at random. Taken as a group, they were over two years younger than the older group, as well as being, on the average, 1.36 inches shorter and 11.21 pounds lighter. They seem to have suffered from no more of the major diseases up to the time of their entrance to college, nor to have required more surgical or medical attention, than the older students. The girls achieved on the average higher medical and motor ability test scores, but were somewhat inferior to their older control group on the anthropometric tests. The boys were inferior to their older fellows in strength tests, but won more laurels in athletic participation. Both boys and girls of the young group engaged in a larger number of athletic activities than the equal number of older students selected at random and comprising the control group.

CHAPTER VII

EXTRA-CURRICULAR AND SOCIAL ACTIVITIES

The Social Setting

Columbia and Barnard Colleges, being situated in the largest city of the nation, attract a highly heterogeneous group of students with widely varying interests and tastes, which, when taken with the limited facilities available for intimate group associations, does not offer the type of social life which characterizes the typical American college campus. Classes are large, prohibiting the informal relationships between student groups and instructors which enrich the academic life of the undergraduate. Out of the noise and rush of the great city come a thousand different diversions and activities which engage the student's attention and, to a great extent, take the place of the activities usually participated in by a greater proportion of the enrollments in the smaller institutions, situated in an environment which does not offer so many outside attractions to draw the student away from the campus. With this in mind, an attempt will be made to present in the following pages a discussion of the social factors and other questions which are to be considered in bringing this study to a conclusion.

Procedure

The same procedure was followed in studying the extra-curricular activities of the young students as was used in treating the data from their physical records. A control group, consisting of the same students used in the physical comparisons and chosen at random from the unselected students entering the colleges during the same period as the younger ones, were compared in extra-curricular participation with the groups in question.

In determining the number of extra-curricular activities engaged in by the young and control groups, the information was obtained and checked from several sources. The senior activity lists, yearbooks, and other publications were carefully examined

to secure the names and activities of the students being considered over the time they were in attendance. The records in the registrar's and other offices were also examined for information which served to check that obtained from the other sources. Each activity was classified according to its nature, as shown by Table XVII.

TABLE XVII

NON-ATHLETIC EXTRA-CURRICULAR ACTIVITIES PARTICIPATED IN BY BOTH GROUPS

ACTIVITY	YOUNG GROUP		CONTROL GROUP	
	Boys	Girls	Boys	Girls
Clubs	43	20	31	21
Publications	32	10	20	9
Social (Greek Letter) fraternities	27	..	19	..
Honorary fraternities	25	9	11	2
Offices (Non-class)	25	10	11	3
Won service letters	23	..	9	..
Committees	17	3	13	1
Dramatics	17	10	12	8
Musical	7	7	5	10
Debate	2	5	..	2
Class offices	1	2	..	..
Total	219	76	131	56
Students participating	95	25	78	23
Average	2.30	3.04	1.69	2.43
Total number of students	126	28	1.26	28
Average for total	1.75	2.71	1.04	2.00

EXTRA-CURRICULAR PARTICIPATION

Ninety-five of the one hundred twenty-four boys in the young group were found to have engaged in one or more campus activities outside the usual college routine. Of those not participating, three were in attendance only a short time before being granted leaves of absence or transferring to other institutions, leaving no record of their campus activities. Four were required to spend their time in other pursuits, because of financial difficulties, and did not have time to participate. Of the remaining number nothing definite could be learned to explain their lack of activity. The number participating in the young group, however, exceeded

that for the control group to a significant extent, being ninety-five in the former group compared to seventy-eight in the latter.

With the girls, twenty-five of the young group were active, compared to twenty-three in the control group. Of the three younger students not participating, one was required to earn part of her way through college; one left school shortly after admission to enter another institution; and one was on probation during the second half of the year she attended.

As was the case with the athletic activities, both sexes in the young group exceed those making up the control group, not only in the total number of activities engaged in, but in the amount of recognition gained. The younger boys were more prominent in clubs, publications, social fraternities, offices, committees, dramatics, and debate, as well as receiving more laurels by being elected to membership in honorary fraternities, winning service letters, and holding class offices. The average number of activities engaged in by those of the young group was 2.30, compared to 1.69 for the boys who were on the average over two years their seniors. The average for the total groups likewise is higher for the younger boys.

The older girls took part in more musical and club activities than the younger group, but were second to the latter in all other activities. The mean number of campus affairs taken part in by the younger girls was 3.04 for those who actually participated, and 2.71 for the entire group, compared to 2.43 and 2.00, respectively, for the control group.

These findings tend to agree with those found by Jones,[1] albeit the averages for both groups and sexes are lower than the number given by Reynolds[2] as the median of extra-curricular activities taken part in by the typical American undergraduate student, namely, 2.64. The greater activity of the girls over the boys included in this study is the opposite of what was reported by Reynolds, in that he found the men joining a larger number and variety of organizations than the women.

The several studies reported on the relations of extra-curricular activities to scholarship are in disagreement. Knox[3] concluded from his investigation of 329 women and 325 men that the non-

[1] Jones, A. J., *The School Review*, 33: 184–90, March 1925.
[2] Reynolds, O. E., *Social and Economic Status of College Students*, p. 56.
[3] Knox, J. E., *Educational Administration and Supervision*, 15: 492, October 1929.

participators were lower in scholarship than the participators, with the women standing higher in their studies than the men. Eurich,[4] from the results of studies conducted in ten prominent universities and colleges over the United States, detected little, if any, real difference between the academic achievement of the fraternity and non-fraternity groups. Wilson[5] found that sorority students, when equated in intelligence with the non-sorority students, secured significantly higher marks than the non-sorority group; and Worcester,[6] after studying the relative scholastic standing of members of Greek-letter organizations in ten colleges and universities, found the fraternity men to rank lower and the women higher than the average for all students; while MacPhail[7] believed the freshmen fraternity pledges in his study to be as a group distinctly inferior to those who were not pledged, in terms of the Thorndike and Brown intelligence tests. Concerning this point, however, it will be remembered from Chapter III that no significant correlation could be found between age, intelligence, scholarship, and number of extra-curricular activities of the young Columbia and Barnard Students.

Limitations of Questionnaire Data

The extent to which the following data concerning the attitudes of the former young students toward the questions involved, and the comparisons of those attitudes with sentiments expressed by other student bodies, can be reliably interpreted is a matter of conjecture. The statements of the Columbia and Barnard groups were tabulated from the results of the questionnaire, which was returned by 95 per cent of the one hundred twenty-four students who represented 79 per cent of the total number being studied. Whether the replies are representative of what would have been obtained from the entire group is not known. The questions on which the writer had information before he sent out the questionnaire showed over 99 per cent agreement when checked with the replies given on the returned questionnaire, indicating the reliability of the response to those questions, but giving no assurance that the other responses were equally reliable. Koos[8]

[4] Eurich, A. C., *School and Society*, 26: 630, November 12, 1929.
[5] Wilson, M. O., *School and Society*, 21: 694, June 6, 1925.
[6] Worcester, D. A., *School and Society*, 18: 147, August 4, 1923.
[7] MacPhail, A. H., *The Intelligence of College Students*, p. 151.
[8] Koos, L. V., *The Questionnaire in Education*, Chap. 7.

states that no figure can be set for the number of returns necessary to determine the validity of a questionnaire, since the number varies to the extent to which it is necessary to secure full returns from the respondents, and the reliability of the information given.

The danger of drawing conclusions from the comparisons made with other student bodies rests in the question of the comparability of the two groups, and in the extent to what the young students have changed in attitude toward the questions involved since they were in college. However, with these reservations in mind, the returns from the questionnaires will be discussed, if for no other reason than to show the attitudes of three-quarters of a group who have had the experience of reacting to the situations with which this study is concerned, and who, perhaps, are in a better position than anyone else to decide the merits of the questions at hand.

Student Attitudes

In the matter of reasons given for attending college, as is shown in Table XVIII, both sexes of the former students answering the questionnaire appear to have been influenced more by extra-curricular interests and less by cultural interests than the Yale students; and the instructor and quality of teaching, social, and family influences were of less weight in the choosing of courses by the younger group than the other reasons given. All groups and both sexes are well agreed that intelligence and personality are the prime factors of "real success in college," and no great difference was indicated between the boys and the Yale group as to the value of extra-curricular activities to the university community. The young girls, however, minimized the value of athletics, in favor of the advantages of literary and dramatic activities. Both sexes of the younger groups differed from the Yale students as regards the value of extra-curricular activities to the individual. Cultural pursuits seemed to be the dominant factor in determining the activities and attitudes of all three groups while in college, but considerable difference was expressed in the ambitions of each group, which were realized to a reasonably satisfactory degree, the younger students having failed to realize their cultural interests to a lesser extent than the Yale group.

The younger boys considered method of presentation, technique, and experience to be most characteristic of the successful

TABLE XVIII

Attitudes Toward Instruction Factors

	Columbia Group 98 Cases	Barnard Group 23 Cases	Yale* Group 1,377 Cases
1. Reasons for attending college			
a. Vocational training	36%	38%	30%
b. Cultural interests	43	44	57
c. Social interests	3	6	6
d. Extra-curricular interests	18	12	0
e. Family influences	0	0	6
2. Reasons for choosing courses			
a. Instructor and quality of teaching	8	13	21
b. Social and family influences	2	6	15
c. Course and schedule requirements	28	6	10
d. Vocational training	11	13	15
e. Cultural aims	18	19	19
f. Subject matter	33	43	20
3. Factors considered most important to real "success in college"			
a. Personality	55	56	51
b. Intellectual ability	37	31	42
c. Social factors	2	0	2
d. Prominence in athletics	3	0	2
e. Prominence in other activities	3	13	2
4. Value of extra-curricular activities to the university community			
a. Athletics	43	6	64
b. Publications	28	38	22
c. Dramatics and debating	3	25	3
d. Other cultural pursuits	12	19	2
e. Social and fraternity interests	14	12	10
5. Value of extra-curricular activities to the development of the individual			
a. Athletics	38	6	62
b. Publications	9	23	17
c. Debating and dramatics	9	25	6
d. Other cultural pursuits	29	19	7
e. Social and fraternity interests	15	25	7
6. Factors most important in determining activities and attitudes in college			
a. Vocational training	20	19	24
b. Cultural pursuits	46	50	54
c. Social interests	14	20	16
d. Extra-curricular interests	11	13	5
e. Family influences	9	0	0
7. Ambitions realized to a reasonably satisfactory degree			
a. Vocational training	31	38	15
b. Cultural interests	42	24	56
c. Social interests	12	19	20
d. Extra-curricular interests	15	13	9
e. Family aspirations	0	6	0
8. Characteristics of a successful teacher			
a. Knowledge of subject, scholarship, research, professional reputation	12	38	22
b. Devotion to teaching, enthusiasm, and personality	44	25	62
c. Method of presentation, teaching techniques, and experience	45	37	16

* From Crawford, A. B., *Incentives to Study*, Chap. 10.

college instructor, while the girls were about evenly divided in opinion between the choice of the boys and that of knowledge of subject and professional reputation. The Yale students believed devotion to teaching, enthusiasm, and personality to be their choice.

Emotional Factors

Table XIX presents data which show the younger students who answered the questionnaire to have been better balanced emotionally than Smiley's 104 cases of unselected college juniors and seniors, the boys having appeared to be more so than the girls. Both sexes of the younger groups apparently felt that their limited freedom previous to entrance to college was more of a handicap than did the 171 Harvard sub-freshmen who were interviewed. Also, too strong home ties in the case of the younger boys and unsatisfactory background in the case of the girls were more disturbing factors than those mentioned by the Harvard freshmen. Miscellaneous distractions were on the whole more frequently mentioned by 125 Harvard freshmen than by the Columbia and Barnard groups, as shown by factors 15 to 28 in Table XIX.

The attitudes of the individuals who had the experience of entering college before they were sixteen years of age are shown in Table XX with regard to questions which were answered by the college authorities in the metropolitan area, as discussed in Chapter I. About one-fifth of the boys and one-quarter of the girls believed the young college student to be in need of being shown how to establish certain habits of thought and work, and about the same number of each sex believed the superior student to be neglected by his parents and the college. About one-eighth of each sex believed the younger student should wait until he was more socially mature before he registered as a college freshman. A very few feared for mental or physical breakdowns, and about one-sixth of each sex felt that the young student was handicapped in the economic order by his youth after he graduated. The possibility of the younger student being more subject to immoral influence while in college attendance was considered by only a relative few, but 40 per cent of the boys and 17 per cent of the girls believed the younger student to have more difficulty adjusting himself to college conditions than the older type. The majority

TABLE XIX

DISTURBANCE FACTORS AMONG YOUNGER STUDENTS

FACTORS	COLUMBIA * 94 Cases	BARNARD * 23 Cases	SMILEY † 104 Cases
1. Self-consciousness	38%	44%	81%
2. Feelings of insecurity	14	25	71
3. Friction or conflict with parents	3	13	70
4. Love or sex problems	8	31	52
5. Religious problems	5	6	13
6. Thoughts of having chosen the wrong vocation	22	0	13
			BRAGDON ‡ 171 Cases
7. Unsatisfactory personality: appearance, voice, manner, etc.	15	19	26
8. No ideas or plans about college study	20	6	21
9. Poor, or no reason for coming to college	5	0	10
10. Poor health or habits	6	6	9
11. Limited freedom previous to college	18	13	6
12. Study or examination difficulties	6	0	6
13. Too strong home ties	18	0	6
14. Unsatisfactory background	2	19	4
			BRAGDON ** 125 Cases
15. Illness in family	2	6	14
16. Sense of unpopularity	9	6	10
17. Poor planning of time	17	13	36
18. Lack of time	6	0	22
19. Laziness	15	50	17
20. Unfavorable working conditions	9	13	24
21. Slow rate of working	5	0	24
22. Tendency to put things off	29	44	52
23. Lack of physical energy	6	13	15
24. Lack of self-control	2	0	2
25. Sensitiveness	17	25	28
26. Moodiness	11	31	19
27. Feeling of being different	17	13	15
28. Oversubmissiveness	8	19	8

of the students answering the questionnaire felt that no time was wasted by early specialization, and that superior students should be grouped for instruction purposes in the classroom, there being little danger of a spirit of academic snobbery resulting from such a grouping.

* Obtained from the questionnaire returns of the young Columbia and Barnard students.

† Study of 104 unselected juniors and seniors, reported by Bragdon, H. D., in *Counseling the College Student*, p. 36.

‡ Counseling problems of 171 Harvard sub-freshmen interviews, *ibid.*, p. 31.

** Disturbance factors of 125 Harvard freshmen during their first year in college, *ibid.*, p. 35.

TABLE XX

ATTITUDES OF THE FORMER YOUNG STUDENTS TOWARD EARLY COLLEGE ENTRY

ATTITUDES	BOYS (94)	GIRLS* (23)
a. Young students need to be shown how to establish the particular habits of thought and work which alone will insure their personal success in college and later life	Yes	Yes
b. Bright students are neglected by both parents and the college in the matter of guidance	20	6
c. Students younger than the average age should not be admitted to college because of their social immaturity	20	4
d. The young student is more apt to suffer a mental or physical breakdown than those of average or older ages	12	3
e. Even if they graduate from college early, they are too young to take their place in the economic order because of their social immaturity	6	1
f. Young students are more apt to be influenced by immoral agencies than are the old groups	16	4
g. Young college students have more difficulty in adjusting themselves to college conditions than the older groups	3	3
h. Early specialization on the part of the young student results in change of plans and waste of time in vocational decisions	38	6
i. Students should be grouped in college according to their ability, regardless of their ages	11	1
j. Such grouping would be undemocratic and result in academic snobbery	43	14
k. Students of all ages derive more values from attending small colleges and classes than large ones	6	2
l. All students can profit from "how to study courses" given at the beginning of the freshman year	22	5
m. Faculty members are more valuable as advisers than older students (big brothers and sisters, etc.)	27	6
	32	12

* Answers obtained from the returns of the questionnaires.

SUMMARY

Reviewing the content of this chapter, Columbia and Barnard Colleges were considered atypical of the American liberal arts undergraduate college, since they do not offer the type and extent of extra-curricular activities engaged in by non-metropolitan student bodies.

The younger college students were found to participate in more extra-curricular activities than the members of the same control group with whom their physical measurements were compared, as well as to receive more recognition for service to their Alma Maters. The average number of activities engaged in, however, was found to be less than that estimated for the country at large. Various studies of the relationship between extra-curricular activities and scholarship were found to differ in their conclusions, and it was recalled that no such relationship between the two were found to exist in this study.

With previously mentioned limitations, the younger students, while differing in many respects from the groups with which they were compared, were thought to be better balanced emotionally, and by their own statements capable of profiting by entering college at an early age in spite of the difficulties which they met.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

Recapitulation

At the beginning of this study it was stated that the objectives were sixfold, namely: (1) To review the literature pertaining to the question of the youth entering colleges while younger than the average age; (2) to secure the opinions of college authorities who were familiar with the problem, as well as the opinions of former students who have had the experience of meeting it; (3) to analyze the records of a group of students who had entered Columbia and Barnard Colleges before they had reached their sixteenth birthday; (4) to study the relationship of certain factors found in their records; (5) to attempt to set up admission criteria which might be used in deciding questions concerning the young freshman applicant; and (6) to test the necessity for minimum age entrance requirements for college admission.

This has been done, and the preceding pages contain the detailed findings, together with the recognized limitations imposed on each. It shall be the purpose of this chapter briefly to summarize those findings, and to draw such conclusions as may seem warranted in light of the available evidence.

Educators and Students Favor Early College Entry

The attitudes of college educators over the nation, as revealed in the literature of the field, were found to be friendly to the idea of the youth entering college as soon as he is mentally mature enough to meet the scholastic entrance requirements. Likewise, those workers whom the writer interviewed in the metropolitan area seemed to believe that the young college applicant could profit from early entry, and that he should be given the opportunity to continue his accelerated development after he enters college. The studies reported showed the younger students to be better developed intellectually than the average groups, and, because of their superior native ability, to achieve more scholastic

success and recognition, and to be found more frequently listed in *Who's Who* after they are graduated.

Of the former students who had gone through the experience of meeting the problems created by their youth, the large majority indicated that they had profited from their higher education in spite of the crises which they had met.

States and Institutions Have Needless Regulations

State colleges and universities, judging from a representative sampling of their catalogues, considered minimum entrance age requirements to a greater extent than did private and parochial institutions, but higher institutional accrediting agencies no longer gave the matter concern. A number of states had statutes on their books which regulated not only the age at which students could be admitted to their higher educational institutions, but the age at which they would be eligible for scholarships. Two states had laws which specifically provided against anyone's being excluded from their institutions of collegiate grade because of age.

The Findings in Columbia and Barnard Colleges

The records of one hundred fifty-four students, all of whom were under sixteen years of age, and who entered Columbia and Barnard Colleges over a five-year period, showed them to be superior in intelligence to their own and other undergraduate bodies as a whole. As a group, they came to college better prepared; exceeded their older fellows in scholarship; suffered fewer failures; and were awarded more academic honors. They participated and gained more recognition in athletic and non-athletic extra-curricular activities than did a similar number of students chosen at random and making up a control group. Compared to this group, they were also better developed physically, for their ages, and had required no more medical attention than the members of their control group who were on the average two years older.

The statistical treatment of the data revealed no significant correlations between age and intelligence, scholarship, physical measurements, or number of extra-curricular activities of the individual, these findings being partially substantiated by other investigations. It was found that the intelligence test score was

the best single criterion of those used to predict the scholastic success of the young student, and from the results of other studies this score can be combined with the high school record, or entrance examination, with still better results.

Recommendations

As for the significance which these findings have for the local institutions, it may be stated that no set rules or regulations can safely be established for deciding the admission fate of the applicant who is younger than those who ordinarily apply. That he is usually an exceptional individual intellectually by virtue of having completed his secondary school preparation in less time than is required by the average or mediocre student is evident, and the indications are that he will make the necessary social adjustments which, along with scholastic achievement, are thought to be important. With his intelligence score, high school record, and other information made available from a personal interview, there is no necessity for following stereotyped procedures in disposing of his case. In fact, it is paradoxical for a state or institution ostensibly fostering a progressive educational program and advocating equal educational opportunity for all desiring to take advantage of it, to institute regulations which prevent the gifted student from completing his higher education as soon as possible in order that he may have a longer period of time in which actually to participate in world affairs, freed of academic fetters.

The extent to which these findings affect other institutions depends on the degree to which the factors at play in the local situation are to be found in others. If it is recognized that, in the final analysis, fitness for admission to college or university is determined primarily by the applicant's ability to achieve academic success, that intelligence and application are the prime requisites of success in any field of learning, and that younger students have given evidence of possessing these requisites by reaching the college doors sooner than the average applicant, then it seems that the same factors are at play, and that the same line of reasoning may be applied to other institutions as was found to apply to the local situation with which this study has been primarily concerned and is now concluded.

BIBLIOGRAPHY

General

Amos, T. W. and Others. *And So To College.* Radio Publication No. 41. Pittsburgh: University of Pittsburgh, 1928.

Anderson, E. W. "Comparative Ages of Liberal Arts and Engineering Freshmen." *School and Society*, 27: 696, June 9, 1928.

Angell, R. C. *Campus.* New York: D. Appleton and Co., 1928.

Baldwin, B. T. and Wood, T. D. *Weight-Height-Age Tables. Tables for Boys and Girls of School Age.* New York: American Child Health Association, 1923.

Bear, R. H. "Factors Affecting the Success of College Freshmen." *Journal of Applied Psychology*, 12: 517–23, 1928.

Bear, R. H. "Factors in the Achievement of College Freshmen." *School and Society*, 24: 802–04, December 25, 1926.

Book, W. F. *How to Succeed in College.* Baltimore: Warwick and York, 1927.

Book, W. F. *The Intelligence of High School Seniors.* New York: Macmillan and Co., 1922.

Bovard, J. F. and Cozens, F. W. *Tests and Measurements in Physical Education, 1861–1925.* Eugene, Ore.: University of Oregon Publication, Vol. 1, No. 1, Physical Education Series, 1926.

Boynton, F. D. *Address on the Responsibility and Opportunities of American Colleges and a Report on Purdue University.* La Fayette, Ind.: Purdue University, 1929.

Bragdon, Helen D. *Counseling the College Student.* Cambridge: Harvard University Press, 1929.

Briggs, T. H. "The New Columbia University Admission Plan." *Education*, 39: 473–80, April 1919.

Brooks, F. D. "The Organization of Mental and Physical Traits During Adolescence." *Journal of Applied Psychology*, 12: 228–41, 1928.

Brooks, R. C. *Reading for Honors at Swarthmore.* Cambridge: Oxford University Press, 1927.

Brotemarkle, R. A. "College Student Personnel Problems." *Journal of Applied Psychology*, 11: 415–16, 1927.

Butler, N. M. "Enrollment of Students at Columbia University." *School and Society*, 22: 788–91, December 19, 1925.

Clark, F. L. "Family Background and College Success." *School and Society*, 25: 237–38, February 19, 1927.

Cleland, J. S. "Distribution of College Grades." *School and Society*, 23: 246–48, February 20, 1926.

Cleland, J. S. "Age at Graduation and Success in Life." *School and Society*, 21: 31–32, January 3, 1925.

Crawford, A. B. *Incentives to Study.* New Haven: Yale University Press, 1929.

Crawford, C. C. "Some Comparison of Freshmen Boys and Girls." *School and Society*, 24: 494–96, October 16, 1926.

Cunningham, A. B. "Sex Elements in College Grades." *School and Society*, 14: 523–25, December 3, 1921.

DeVoto, B. "College and the Exceptional Man." *Harper's Magazine*, 154: 253–60, January 1927.

Dexter, E. S. "What Constitutes Popularity in Course or Individual." *School and Society*, 23: 758–60, June 12, 1926.

Doermann, A. J. *Orientation of the College Freshman.* Baltimore: Williams and Wilkins, 1926.

Ellis, R. S. "A Comparison of the Scores of College Freshmen and Seniors on Psychological Tests." *School and Society*, 23: 310–12, March 6, 1926.

Eurich, A. C. "Relation of Achievement Between College Fraternity and Non-Fraternity Groups." *School and Society*, 26: 624–30, November 12, 1927.

Field, W. L. W. "College Entrance Requirements." *Atlantic Monthly*, 142: 84–86, July 1928.

Forsyth, C. H. "Correlation Between Ages and Grades." *Journal of Educational Psychology*, 3: 164, March 1912.

Frasier, G. W. "College Entrance: A New Plan." *School Executives' Magazine*, 49: 73–75, October 1929.

Galton, F. "Useful Anthropometry." *Proceedings of the American Association for the Advancement of Physical Education*, 6: 51–57, 1891.

Garrett, H. E. and Kellogg, W. N. "The Relation of Physical Constitution to General Intelligence, Social Intelligence, and Emotional Instability." *Journal of Experimental Psychology*, 11: 113–29, April 1928.

Garrison, K. C. "Intelligence Test Scores and Choice of Major Field." *School and Society*, 28: 630–32, November 17, 1928.

Gowen, J. W. and Gooch, M. E. *Mental Attainments of College Students in Relation to Previous Training, Environment, and Heredity.* Orono, Maine: University of Maine, 1926.

Greenleaf, W. J. "Self-Supporting Students in Colleges and Universities." *School Life*, 11: 188–89, June 1926.

Hale, C. B. and Carroll, W. B. "What Freshmen Read." *Educational Review*, 70: 260–63, December 1925.

Hawkes, H. E. *College, What's the Use?* Garden City: Doubleday Page and Co., 1927.

Herriott, M. E. *Attitudes as Factors of Scholastic Success.* University of Illinois Bulletin No. 47. Urbana, Ill.: University of Illinois, 1929.

Hollingworth, L. S. *Gifted Children, Their Nature and Nurture.* New York: Macmillan and Co., 1927.

Hollingworth, L. S. "Subsequent History of E——; Ten Years After the Initial Report." *Journal of Applied Psychology*, 11: 385–90, October 1927.

Hudelson, E. (editor). *Problems of College Education.* Minneapolis: University of Minnesota Press, 1928.

Javis, P. G. H. "Mental Tests as Entrance Requirements to State Supported

Institutions from the Legal Viewpoint." *School and Society*, 21: 280–81, March 7, 1925.

JONES, A. J. "Age at Graduation from College and Success in Life." *The School Review*, 33: 184–90, March 1925.

JONES, A. L. "College Standing of Freshmen of Various Ages." *School and Society*, 3: 717–20, May 13, 1916.

JORDAN, D. S. *Trend of the American University*. Stanford University, California: Stanford University Press, 1929.

JONES, ESTHER MC. LLOYD. *Student Personnel Work at Northwestern University*. New York: Harper and Brothers, 1929.

JONES, H. E. "Comparison of the Intelligence of Extension and College Undergraduate Students." *School and Society*, 26: 469–700. October 8, 1927.

KEATOR, M. and BECHTEL, H. W. *Report of the Thorndike Intelligence Examination. Part III as Administered in the Connecticut State Normal Schools*. Hartford, Conn.: State Board of Education, 1927.

KNOX, J. E. and DAVIS, R. A. "Scholarship of University Students Participating in Extra-curricular Activities." *Educational Administration and Supervision*, 15: 481–93, October 1929.

KOERTH, W. and RUCH, G. M. "Validity of Self-Estimates of College Marks." *School and Society*, 18: 88–90, July 21, 1923.

KOOS, L. V. *The Questionnaire in Education*. New York: The Macmillan Co., 1928.

LAIRD, D. A. "Case Studies in Mental Problems of Later Adolescence with Special Reference to the Mental Hygiene of the College Student." *Mental Hygiene*, 7: 715–33, October 1923.

LEONARD, R. J., EVENDEN, E. S., O'REAR, F. B. AND OTHERS. *Survey of Higher Education for the Lutheran Church in America*, Vol. I. New York: Bureau of Publications, Teachers College, Columbia University, 1929.

MACPHAIL, A. H. *The Intelligence of College Students*. Baltimore: Warwick and York, 1924.

MANN, C. V. "Evaluation of Placement Examinations." *Journal of Engineering Education*, Vol. 19, No. 3, November 1928.

MORGAN, A. E. "Tobacco and Scholarship; Excerpts." *Industrial Education Magazine*, March 27, 1926.

MOSHER, R. M. "The Intelligence and Achievement of Normal School Students." *Journal of Applied Psychology*, 12: 335–42, 1928.

NATIONAL EDUCATION ASSOCIATION. *The Questionnaire*. Research Bulletin, Vol. 8, No. 1. Washington: Research Division of the National Education Association, January 1930.

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION. "The Education of Gifted Children." *Twenty-third Yearbook*, Part I. Bloomington, Ill.: Public School Publishing Co., 1924.

NELSON, M. J. and DENNY, E. C. "The Terman and Thurstone Group Test as a Criteria for Predicting College Success." *School and Society*, 26: 501–02. October 15, 1927.

ODELL, C. W. *Are College Students a Select Group?* University of Illinois Bulletin, Vol. 24, No. 36. Urbana, Ill.: University of Illinois. 1927.

ODELL, C. W. *Predicting the Scholastic Success of College Freshmen.* University of Illinois Bulletin, Vol. 25, No. 32. Urbana, Ill.: University of Illinois, 1927.

PITTENGER, B. F. "The Efficiency of College Students as Conditioned by Age at Entrance and Size of High School." *Sixteenth Yearbook of the National Society for the Study of Education,* Part II. Bloomington, Ill.: Public School Publishing Co., 1917.

PRESSEY, L. W. *Some College Students and Their Problems.* Columbus, Ohio: The Ohio State University Press, 1929.

PRESSEY, S. L. *Research Adventures in University Problems.* Bloomington, Ill.: Public School Publishing Co., 1927.

Public Men and Women of America. New York: Hamersly and Co., 1910.

REEVES, F. W. and RUSSELL, J. D. *College Organization and Administration.* Indianapolis: Indiana Board of Education, Disciples of Christ, 1929.

REEVES, F. W. and RUSSELL, J. D. *Some Aspects of Current Efforts to Improve College Instruction.* Bulletin of the Bureau of School Service, Vol. I, No. 2. Lexington, Ky.: University of Kentucky, December 1928.

REYNOLDS, O. E. *Social and Economic Status of College Students.* Teachers College Contributions to Education, No. 272. New York: Bureau of Publications, Teachers College, Columbia University. 1927.

REVIEW OF REVIEWS. "College Athletics and Scholarship." *Review of Reviews,* 73: 423–24, April 1926.

RICE, J. A., JR. "Exceptional Student in the Middle West." *School and Society,* 22: 543–47, October 31, 1925.

ROBERTS, A. C. "Problems of College Admission." *School and Society,* 17: 246–52, March 3, 1923.

ROBERTSON, D. A. (editor). *American Universities and Colleges.* New York: Charles Scribner's Sons, 1928.

ROGERS, A. L. "What Women in Colleges of Liberal Arts Specialize In." *School and Society,* 20: 700–02, November 29, 1924.

ROGERS, A. L. "The Intelligence Level and Academic Achievement of Conditioned Students." *Educational Administration and Supervision,* 10: 395–98, September 1924.

ROGERS, A. L. "The Causes of Elimination in Colleges of Liberal Arts for Women." *Educational Administration and Supervision,* 12: 145–54, March 1926.

ROGERS, A. L. "Mental Tests for the Selection of University Students." *British Journal of Psychology,* 15: 405–15, December 1924.

SMITH, C. A. "Why Students Leave College." *Educational Administration and Supervision,* 9: 339–44, September 1923.

SMITH, H. A. "College Records and Success in Life." *Education,* 47: 513–29, May 1927.

STARCH, D. *Educational Psychology.* Revised edition, Chap. 23. New York: Macmillan and Co., 1929.

TATLOCK, J. S. P. "College Honors and Success in Life." *School and Society,* 15: 647–48. June 10, 1922.

TERMAN, L. M. "Mental Characteristics of Various Groups of College Students." *School Review,* 32: 406–07, June 1924.

THOMBERG, L. H. "College Scholarship and Size of High School." *School and Society*, 20: 189–92, August 9, 1924.

TOOPS, H. A. "Away With High School Points and Credits." *School Executives' Magazine*, 49: 8–10, September 1929.

TOOPS, H. A. *Academic Progress.* Columbus, Ohio: The Ohio State University Press, 1928.

UNITED STATES BUREAU OF EDUCATION. *List of References on Higher Education*, Library Leaflet, No. 28, 1924. Washington: Government Printing Office, 1924.

UNITED STATES BUREAU OF EDUCATION. *Statistics of Higher Education*, Bulletin No. 7, 1929. Washington: Government Printing Office, 1929.

UNITED STATES BUREAU OF EDUCATION. *The Trend of College Entrance Requirements, 1913–1922.* Bulletin No. 35, 1924. Washington: Government Printing Office, 1925.

VAN WAGENEN, M. J. "Has the College Student Reached His Mental Maturity When He Enters College?" *School and Society*, 9: 663–66, May 31, 1919.

WAYMAN, A. R. *Medical, Anthropometric, and Motor Ability Tests For College Women.* New York: Barnard College, Columbia University, no date.

WHINERY, S. M. "Psychological Test Ratings and College Entrance Age." *School and Society*, 24: 370–72, September 18, 1926.

WILSON, M. O. "Intelligence and Educational Achievement of 250 Freshmen Women at the University of Oklahoma." *School and Society*, 21: 693–94, June 6, 1925.

WOOD, B. D. *Measurement in Higher Education.* Yonkers: World Book Co., 1923.

WORCESTER, D. A. "Fraternities and Scholarship." *School and Society*, 18: 147–48, August 4, 1923.

ZEIGEL, H., JR. "Achievement of High School Honor Students in the University of Missouri." *School and Society*, 25: 82–84, January 15, 1927.

LEGAL

ARKANSAS. *Crawford and Moses 1921 Statutes*, Sec. 9596.

CALIFORNIA. *Political Code 1923*, Sec. 1392.

COLORADO. *Compiled Laws 1921*, Sec. 8070.

DELAWARE. *Revised Code 1915*, Sec. 2334.

FLORIDA. *Compiled Laws 1927*, Sec. 791.

ILLINOIS. *Smith and Hurd Revised Statutes 1929*, Chap. 144, Sec. 29.

KENTUCKY. *Carroll's Statutes 1922*, Sec. 4636C–28.

KANSAS. *Revised Code of 1923*, Chap. 76, Sec. 307.

LOUISIANA. *Marrs, Ann. Revised Statutes 1915*, Sec. 2706.

MAINE. *Revised Statutes 1916*, Sec. 143, p. 389.

NEW YORK. *McKinney's Statutes 1928*, Sec. 600, Education Law.

TEXAS. *Vernon's Annotated Texas Statutes, 1926*, Sec. 2639 and 2648.

WASHINGTON. *Compiled Statutes 1922*, Sec. 4620.

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